INFANT CARE SYSTEM
AND
MOBILE INFANT WARMER

SERVICE MANUAL

NARCO SCIENTIFIC

WARRANTY

The product described in this manual is under warranty for a period of one year, with the following exception:

All consumable and disposable products are warranted to be free from defects upon shipment only.

During the one year warranty period, any parts other than those listed above, found by a certified Air-Shields dealer to be defective in material or workmanship will be replaced at no charge, except labor costs, to the customer.

This warranty is rendered void and Air-Shields cannot be held liable for conditions resultant therefrom if:

1. Damage to the unit is incurred as a result of mishandling.
2. The customer fails to maintain the unit in a proper manner.
3. The customer uses any parts, accessories, or fittings not manufactured or sold by Air-Shields.
4. Sale or service is performed by a non-certified service/dealer agency.

This warranty is in lieu of all other warranties, expressed or implied.

NOTE: We suggest that the hospital safeguard its warranty by participating in our Guardian Maintenance Insurance Program, or those offered by our certified dealers.

SERVICE

Prompt and efficient service for your Air-Shields product is readily available through your certified Air-Shields dealer or service center by telephone. Please follow these instructions before placing your call:

1. Have the unit available.
2. Have the person who is most familiar with the problem make the telephone call.
3. Have these operating instructions on hand.
4. Have the serial number of the unit on hand.

In some instances, a few simple suggestions or perhaps a minor adjustment which you can make, will quickly solve the problem.

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NARCO SCIENTIFIC
AIR-SHIELDS DIVISION
HATBORO, PENNSYLVANIA 19040 U.S.A.

E 1 2 3 4 5 6 7 8 9

Cat. No. 78 990 12-2

A 1 2 3 4 5 6 7 8 9

Printed in U.S.A.
FIRST PRINTING 6/80
CHANGE 1 1/81

PLEASE READ

Please check for change information attached to the rear cover of this manual.

Since Air-Shields, Inc. conducts a continuous product improvement program, circuit and component improvements are sometimes incorporated into equipment before they can be incorporated into the printed manuals. When this occurs, changed material is provided on separate sheets at the rear of the manual or under separate cover in the form of a change package. Changed material on each page or text is indicated by a vertical bar in the margin next to the changed material, as shown on the right.

NOTE ON REPL. PARTS:

Some parts used in your equipment may be different than those which appear in the Parts List of this manual. This sometimes occurs because of difficulty in parts procurement, but does not alter the function of the equipment. Order the part listed in the Parts List.

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SECTION 1
GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides instructions for installation, use, operator maintenance, troubleshooting, and repair of the Air-Shields® Infant Care System and the Air-Shields® Mobile Infant Warmer.

It is the responsibility of the user to operate the unit in accordance with the instructions in this manual, and to ensure that the maintenance recommendations in Section 5 of this manual are performed. Maintenance requirements so indicated must be performed only by Air-Shields certified service representatives.

This manual should be read thoroughly by all personnel who will be working with the unit.

1.2 DESCRIPTION

The Air-Shields® Infant Care System is designed to provide an integrated system that may be used immediately after birth, during special procedures, or for long term treatment of infants requiring access, visability, thermal support and/or aspiration, and when other special needs are required.

The Air-Shields® Mobile Infant Warmer is designed to provide warmth and to be readily moved and used with bassinets currently in use in the nursery.

The Infant Care System consists of a Cart/Bassinet, oxygen delivery system, Warmer Module, and either a Manual or Servo Controller Module. The Mobile Infant Warmer consists of the Warmer Module and the Manual or Servo Controller Module.

1.3 EQUIPMENT PROVIDED AND ACCESSORIES

Since this manual provides maintenance and parts information for currently manufactured systems as well as equipment no longer manufactured, all questions relating to equipment provided and accessories should be directed to your sales representative. A typical Infant Care System is shown in Figure 1.1.

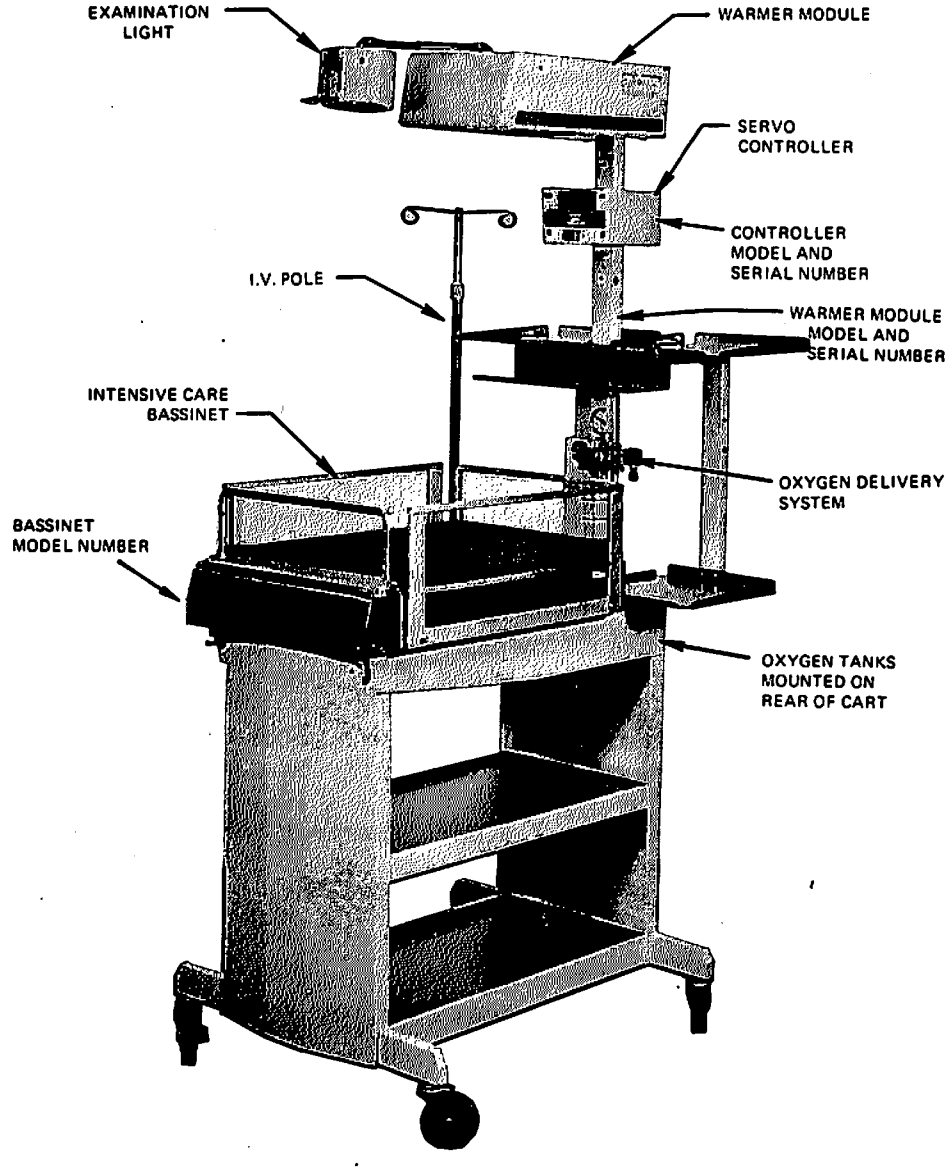

FIGURE 1.1 TYPICAL INFANT CARE SYSTEM

SECTION 2
INSTALLATION

2.1 INSTALLATION PROCEDURE

2.1.1 INFANT CARE SYSTEM

A. The Infant Care System is shipped broken down to four assemblies. The Cart/Bassinet, Warmer Module Post, and Manual or Servo Controller. Assembly will require no special tools.

B. Refer to Figure 2.1 and slide the line cord through the Arm Catch Assembly (1), then slide the Warmer Module Post through the Arm Catch Assembly.

C. Position the bottom of the Warmer Module Post over the projection (2) on the Base Assembly. Secure the bottom of the Warmer Module Post to the Base Assembly with the 2-1/2" long bolt and "KEPS" nut (4 and 5).

D. Secure the Warmer Module Post to the Cart/Bassinet Assembly, using the Tilt Knob (6).

E. Plug the controller (7) into the receptacle on the Warmer Module Post, then secure it using the Bracket (8), screw (10), and washer (9).

F. Before the Bassinet is placed on the Infant Care System, the Rear Panel Retaining Knob must be installed on the Bassinet. The Retaining Knob is contained in a plastic bag in the Bassinet shipping carton.

G. Remove the Bassinet and Retaining Knob from the carton. Screw the black Retaining Knob into the hole located on the center of rear of the Bassinet until the knob is contacting the panel.

H. Install the locknut provided on the Retaining Knob as illustrated in Figure 2.2.

I. Place the Adjustment Control of the Bassinet in the center slot of the Cart Adjustment Bracket. Grasp the Release Mechanisms under the center of each side of the Bassinet, pull outward, and lower it on the Cart.

2.1.2 MOBILE INFANT WARMER

A. The Mobile Infant Warmer is shipped broken down to three assemblies. The Base Assembly, Warmer Module Post, and Manual or Servo Controller. Assembly will require no special tools.

B. Refer to Figure 2.2 and Mount the Warmer Module Pose (1) on the Base Assembly (2). Secure the Warmer Module Post to the Base Assembly using the two allen screws (3).

C. Plug the controller (4) into the receptacle on the Warmer Module Pose, then secure it using the Bracket (6), screw (6), and washer (7).

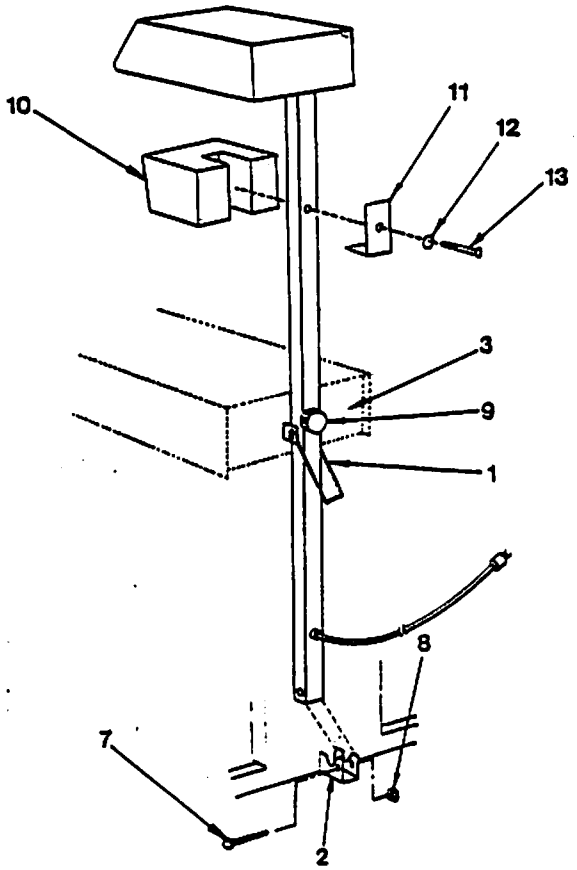

FIGURE 2.1 ASSEMBLING THE INFANT CARE SYSTEM

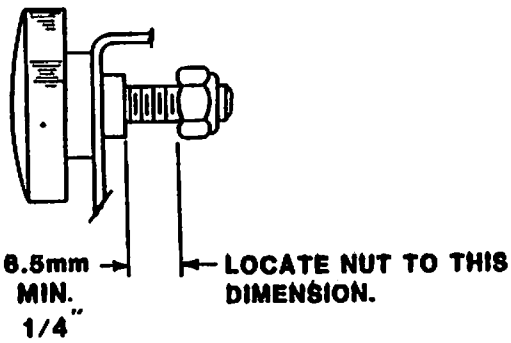

FIGURE 2.2 INSTALLATION OF RETAINING KNOB

2.2 CLEANING

The Infant Care System and Mobile Infant Warmer should be cleaned as necessary using the procedures described in Section 4, Paragraph 4.2 of this manual.

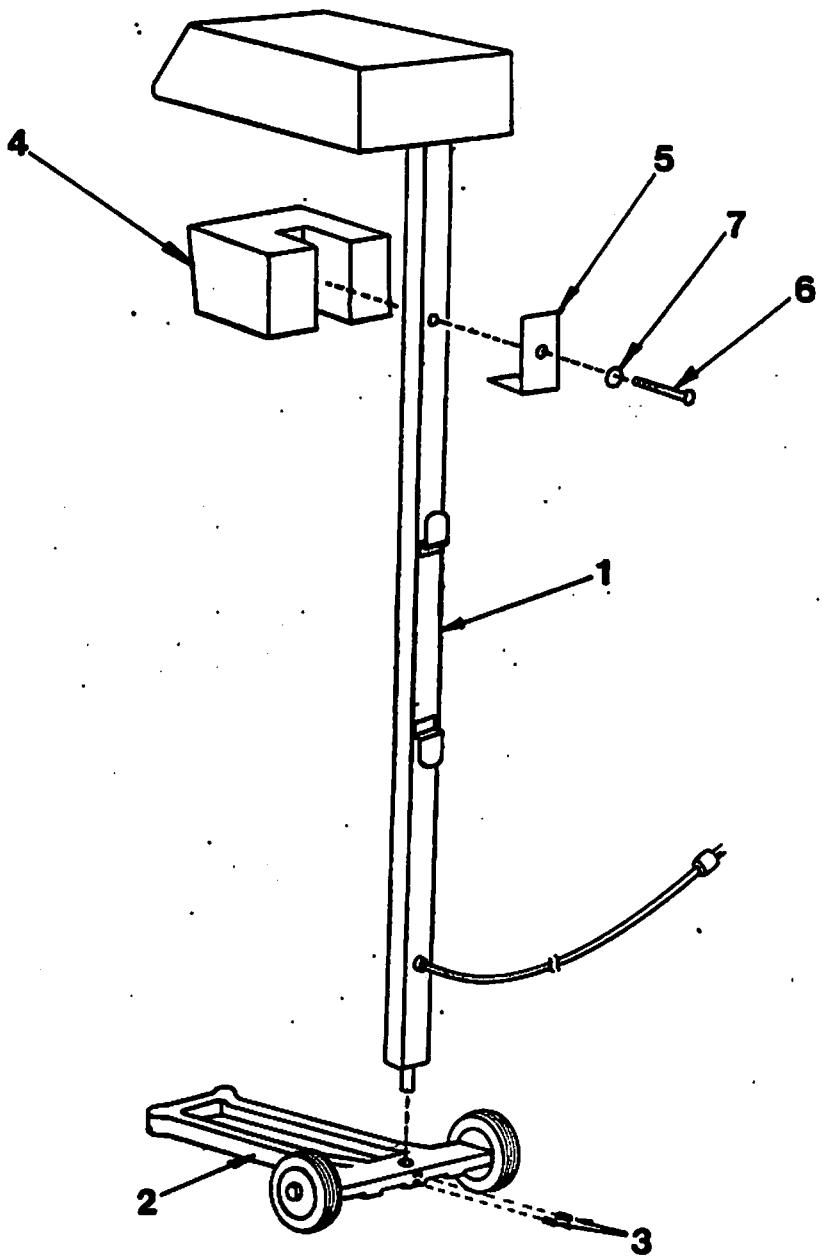

FIGURE 2.3 ASSEMBLING THE MOBILE INFANT WARMER

2.3 OPERATIONAL CHECKOUT

Periodically, especially if the Infant Care System or the Mobile Infant Warmer have not been in use, the units should be routinely checked for proper operation.

2.3.1 STANDARD BASSINET

A. Inspect both sides of the bassinet for proper installation.

B. Inspect the sides for damage.

C. Inspect the End Panel for proper installation.

D. Check that the bassinet can be placed in the horizontal, Fowler, and Trendelenburg positions using the tilt mechanism.

2.3.2 INTENSIVE CARE BASSINET

A. Check that the sides cannot be lowered without depressing the acuation buttons and slide freely after the acuation buttons have been depressed.

B. Check that the front panel cannot be lowered without acuating the pull knobs.

C. Check that the rear panel is properly installed.

D. Grasp the mattress Tilt Controls and pull forward. Then raise and lower the bassinet to either the horizontal, Fowler, and Trendelenburg positions. Release the Tilt Controls and check for proper engagement in each position. Check that the bassinet positions cannot be changed without acuating the Tilt Controls.

2.3.3 EXAMINATION LIGHT

> CAUTION: To ensure grounding reliability, connect power cord on to properly ground 3-wire hospital grade or hospital use outlet of correct voltage and frequency. DO NOT USE EXTENSION CORDS.

A. Connect the Infant Care System or Mobile Infant Warmer power cord to the ac line.

B. Place the Examination Light Switch on the Warmer Module Post in the ON position. The Examination Light should be lit.

C. Move the Examination Light Handle so that the light shines on the Bassinet Mattress area. Turn off the light.

2.3.4 WARMER MODULE

Operational checkout of the Warmer Module is accomplished by performing either the Manual or Servo Controller procedures.

2.3.5 MANUAL CONTROLLER

A. Place the Controller Power ON-OFF Switch in the ON position.

B. Rotate the TEMPERATURE Control from MIN to MAX. The Warmer Module Heater should come on.

2.3.6 SERVO CONTROLLER (SC78-1)

A. Place the Power ON/OFF Switch in the ON position. The POWER Indicator should be lit.

B. Depress and hold the METER CAL-ON Switch and adjust the CAL ONLY Control while observing the TEMPERATURE Meter. The Meter reading should be 100°F (37.8°C).

C. Insert the PATIENT PROBE in the Rear Panel and position it so that the tip of the probe is above the Mattress. Rotate the TEMPERATURE CONTROL ISC-MANUAL Control in the MANUAL range. Observe the change in TEMPERATURE Meter readings.

D. Rotate the TEMPERATURE CONTROL ICS-MANUAL Control to the full clockwise position until it clicks into ISC. Rotate the POINT CONT Knob to a desired temperature indicated by the Red Pointer on the TEMPERATURE Meter. The White Pointer on the TEMPERATURE Meter will climb to the setting indicated by the RED Pointer.

E. Alarm System - Visual and Audible Alarms will automatically activate should the temperature deviate $\pm$ 1°F (0.6°C) from the Control Point. The Audible Alarm should sound and the alarm light should flash at a rate of approximately two (2) times per second. When the skin temperature returns to within the $\pm$ 1°F (0.6°C) variance, the alarm should shut off. The Audible Alarm may be silenced by sliding the Audible Alarm Switch to the OFF position; however, IT SHOULD BE SILENCED ONLY BRIEFLY during procedures which may cause false or temporary temperature variations from the prescribed control point.

2.3.7 SERVO CONTROLLER (SC78-2)

A. Disconnect the Patient Probe from the rear of the controller. Place the POWER ON/OFF switch to the OFF position.

B. Adjust the CONT POINT knob until the Red Pointer indicates 92°F (33°C).

C. Place the Controller POWER ON-OFF switch to the ON position. The White Pointer should indicate 104 $\pm$ 1°F (40 $\pm$ 0.5°C). The Audible Alarm should be silent and the ALARM Indicator should be ON. The HEATER OUTPUT meter should read 0 and the Warmer Module Heater should be off.

D. Rotate the CONT POINT knob until the Red Pointer indicates 100°F (37.8°C). After 15 minutes, the Audible Alarm should sound and the ALARM Indicator should flash.

E. Depress the SILENCE switch. The Audible Alarm should go silent and the ALARM Indicator should be steady-ON.

F. Rotate the CONT POINT knob until the Red Pointer is lined up with the White Pointer. The ALARM Indicator should go OFF. The HEATER OUTPUT meter should read 1/2 or greater and the Warmer Module Heater should be ON.

G. Rotate the CONT POINT knob slowly counterclockwise until the Audible Alarm sounds. The Red Pointer should indicate 2° ± 0.8°F (1.0 ± 0.4°C) less than the White Pointer. The HEATER OUTPUT meter should read 0 and the Warmer Module Heater should be OFF.

H. Depress the SILENCE switch. The Audible Alarm should go silent and the ALARM Indicator should be steady-ON.

Insert the Temperature Probe (not attached to an infant) into the PATIENT PROBE INPUT on the rear of the unit. The White Pointer on the meter should read ambient temperature (full left on meter). To calibrate the temperature meter, depress the METER CAL Switch and hold it in this position while adjusting CAL ONLY to indicate a 100°F (37.8°C) reading (red line on the meter). Release the METER CAL Switch. The White Pointer on the meter should read ambient temperature (full left on meter).

2.3.8 RESUSCITATION AND ASPIRATION

TWIN-O-VAC

> WARNING: Since mixtures of oxygen and flammable vapors, such as alcohol, ether, ethylene, and cyclopropane may explode if ignited, an explosion hazard exists if the units are used in the presence of these gasses.

A. Suction Check - If the source of oxygen to drive the suction generator is tanks attached to the Infant Care System, be sure that the tank valve is open and the tanks are not depleted by observing that the tank pressure gauge reads between 200 and 2500 psi. If the source of oxygen is the wall, be sure that the pressure is 50 ± 5 psi and that the valves leading to the Infant Care System O_2 inlet fitting are open.

   Open the suction control knob fully counterclockwise, occlude the metal suction inlet tube, and observe that at least 300 mm Hg is registered on the suction gauge. If the suction reading is low, recheck that the jar washer is in good condition.

B. Oxygen Delivery Check - Open the flowmeter flow control and check that operation is satisfactory through the full range of flows.

RESUSCITATION PACKAGE

> WARNING: Since mixtures of oxygen and flammable vapors, such as alcohol, ether, ethylene, and cyclopropane may explode if ignited, an explosion hazard exists if the units are used in the presence of these gasses.

Before proceeding, place the following valves and controls in the position indicated.

- Valves on oxygen cylinders turned fully counterclockwise
- Valve on flowmeter turned fully clockwise
- Vacuum Control (needle valve) turned fully clockwise
- Vacuum Control (venturi) turned fully clockwise

A. Using the wrench, open the cylinder valve by turning clockwise. Observe the green gauge on the resuscitation post; the reading should be a minimum of 200 psi.

B. Close the cylinder valve and relieve the pressure by turning the flowmeter knob slightly counterclockwise. Repeat step 1 using the other cylinder.

C. Close both cylinder valves.

D. Attach a high pressure hose (50 $\pm$ 5 psig) with a male DISS (Diameter Index Safety System) fitting from a source of oxygen to the connection labeled INPUT FROM WALL OXYGEN.

E. Set the flowmeter to the desired level by turning the knob. The rate of flow is determined by reading the top of the float in the flowmeter.

ASPIRATION PACKAGE

A. Attach the wall vacuum tubing to the wall vacuum fitting underneath the vacuum gauge.

B. Occlude the patient end of the aspiration tubing. Adjust the vacuum needle valve and observe the vacuum gauge and determine if a vacuum is present.

VENTURI RESUSCITATION/ASPIRATION PACKAGE

> WARNING: Since mixtures of oxygen and flammable vapors, such as alcohol, ether, ethylene, and cyclopropane may explode if ignited, an explosion hazard exists if the units are used in the presence of these gasses.

A. Turn on oxygen from either a cylinder or wall source.

B. Occlude the patient end of the aspiration tubing. Adjust the vacuum needle valve and observe the vacuum gauge and determine if a vacuum is present.

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SECTION 3

TECHNICAL INFORMATION

3.1 SPECIFICATIONS

Specifications for the Air-Shields® Infant Care System and Mobile Infant Warmer are provided in Table 3.1.

TABLE 3.1 SPECIFICATIONS

INFANT CARE SYSTEM

Environmental

Temperature Range	15° to 40°C
Humidity	0 to 95%
Vibration and Shock	Normal Nursery Handling
Altitude	Sea Level to 3000 meters

Mechanical - Cart/Intensive Care Bassinet Assembly With Warmer Module:

Height (floor to top of Warmer Module)	201.9 cm (79-1/2 inches)
Length (at wheelbase)	99.0 cm (39 inches)
Length (with Monitor shelves)	112.5 cm (48-1/4 inches)
Width (at wheelbase)	71.1 cm (28 inches)
Width (at cart top-width of bassinet)	58.4 cm (23 inches)
Height of mattress from floor	101.6 cm (40 inches)
Length of module power cord	3.15 meters (10'4")

Mechanical - Cart/Standard Bassinet Assembly With Warmer Module:

Height (floor to top of Warmer Module)	201.9 cm (79-1/2 inches)
Length (at wheelbase)	99.0 cm (39 inches)
Length (with Monitor shelves)	108.7 cm (46-3/4 inches)
Width (at wheelbase)	71.1 cm (28 inches)
Width (at cart top - width of bassinet)	40.0 cm (16-1/2 inches)
Height of mattress from floor	96.5 cm (28 inches)
Length of module power cord	3.15 meters (10'4")

Oxygen Input Requirements

From cylinder	up to 2500 psi
From wall	50-55 psi nominal

Electrical

120V Models	99 - 132, 50/60 Hz, 630 watts
220V Models	198 - 264V, 50/60 Hz, 630 watts
100V Models	85 - 115V, 50/60 Hz, 630 watts

TABLE 3.1 SPECIFICATIONS (CONTINUED)

MOBILE INFANT WARMER

Mechanical

Height	187.8 cm (74 inches)
Depth	64.8 cm (25-1/2 inches)
Weight	29.5Kg (65 lbs)
Width of wheelbase	55.9 cm (22 inches)
Distance, floor to lowest electrical connection (optional light switch)	153.7 cm (60-1/2 inches)
Length of Power Cord	3.15m (10'4")

Electrical

120V Models	99 - 132, 50/60 Hz, 630 watts
220V Models	198 - 264V, 50/60 Hz, 630 watts
100V Models	85 - 115V, 50/60 Hz, 630 watts

INTENSIVE CARE BASSINET

Height	26 cm (10-1/4 inches)
Width	58 cm (23 inches)
Length	77 cm (30-1/4 inches)
Height of sides from mattress surface	12.7 cm (5 inches)
Width of mattress	48.3 cm (19 inches)
Length of mattress	66.0 cm (26 inches)
Weight	16 Kg (36 lbs)

STANDARD BASSINET

Length	77.5 cm (30 inches)
Width	40.0 cm (17 inches)
Height	18.0 cm (7 inches)
Weight	7 Kg (15-1/2 lbs)

EXAMINATION LIGHT

Lamp housing	
Diameter	14 cm (5-1/2 inches)
Height	11 cm (4-1/4 inches)
Support Arm	
Diameter	1.6 cm (1/2 inch)
Length	38 cm (15 inches)
Weight (total)	7 Kg (15-1/2 lbs)
Light Output	250 foot candles

TABLE 3.1 SPECIFICATIONS (CONTINUED)

WARMER MODULE (EXCLUDING SUPPORT POST)	
Warmer Housing	
Length	56 cm (22 inches)
Width	27 cm (10-1/2 inches)
Height	15 cm (6 inches)
RECEPTICAL BOX (120 Vac)	
Length	39 cm (15-1/2 inches)
Width	4.5 cm (1-3/4 inches)
Height	9 cm (3-1/2 inches)
Weight	3 Kg (6-3/4 lbs)
Voltage	120 VAC @ 10 amp max.
GAS CONSOLE	
Width	30 cm (12 inches)
Depth (Including Outlet Fittings)	9 cm (3-1/2 inches)
Height	10 cm (4 inches)
Inputs	
Oxygen	55 psi (maximum)
Air	55 psi (maximum)
Suction	1 atmosphere
Color Code	Inlet Hoses and Front Panel Yellow-Air, Green-O_2, White-Suction
Output	Pneumatic - DISS fittings with check valves
Input Hoses	1.5 or 3.1m (5 or 10 feet) with or without DISS fittings
CONTROLLERS	
Manual Controller	
Length	9.6 cm (3-3/4 inches)
Width	15.6 cm (6 inches)
Height	9.1 cm (3-1/2 inches)
Weight	0.61 Kilograms (1-1/2 lbs)

TABLE 3.1 SPECIFICATIONS (CONTINUED)

Overload Protection

120V Models	8 amp Quick Acting
220V Models	5 amp Quick Acting
100V Models	8 amp Quick Acting

Servo Controller

Dimensions

Height	12 cm (4-3/4 inches)
Width	17 cm (6-3/4 inches)
Depth	21 cm (8 inches)

Weight	3.0 Kilograms (6.6 lbs)

Overload Protection

110-120V Models	8 amp Quick Acting
220-240V Models	5 amp Quick Acting
100V Models	8 amp Quick Acting

Temperature Indication Range (when calibrated using front panel control)	92 to 104 $\pm$ 0.4°F 33 to 40 $\pm$ 0.2°C
Set Point Range	92 to 104°F (33.33 to 40°C)
Accuracy	$\pm$ 0.6°F (0.3°C)
Type of Display	Meter
Alarm (Visual)	Blinking light (approximately one flash per second) when temperature deviates $\pm$ 1°C (1.8°F) from control set point.
Alarm (Audible)	A pulsed tone with a period of approximately one second during alarm period.

3.2 THEORY OF OPERATION

3.2.1 GENERAL

This section contains functional descriptions of the following components:

Warmer Module
Manual Controller
Servo Controller (SC78-1)
Servo Controller (SC78-2)
Resuscitation/Aspiration System

3.2.2 WARMER MODULE (REFER TO FIGURE 7.8)

The theory of operation of the Warmer Module is explained in conjunction with each controller.

3.2.3 MANUAL CONTROLLER (REFER TO FIGURES 7.1 AND 7.4)

The Manual Controller controls the Warmer Module Heater. Q1 is a bidirectional trigger which sets a consistant trigger level for Triac Q2. R1, R2, R3, C1, and C2 provide the variable phase within a half line cycle to fire Q1 and to provide maximum to minimum heater output. L1 and C3 provide effective attenuation of the high frequency harmonics produced by the switching Triac Q2.

3.2.4 SERVO CONTROLLER (SC78-1) (REFER TO FIGURES 7.2 AND 7.5)

Servo Controller (SC78-1) functions in either a manual or an Infant Servo Control (ISC) mode.

Manual Mode utilizes a skin temperature probe which is attached to the infant to sense the skin temperature. The skin temperature is displayed on a front panel meter.

The skin temperature is manually adjustable with a front panel control to the skin temperature prescribed by the attending physician with a maximum temperature of approximately 1°F above the control point setting.

ISC Mode utilizes a skin temperature probe which is attached to the infant to sense the skin temperature. The skin temperature is displayed on a front panel meter which contains a temperature control point indicator.

The control point is adjustable to the temperature prescribed by the attending physician. The sensed skin temperature is relayed to the controller which proportionally increases or decreases the Warmer Module heater output to maintain a stable skin temperature.

The unit is equipped with a visual and audible alarm system which senses temperature deviations of $\pm$ 1°F (0.6°C) from the control point. When the deviation occurs, the audible alarm will sound and the alarm light will flash. When the skin temperature returns to within $\pm$ 1°F (0.6°C), the alarm system will reset. The audible alarm can be silenced while special procedures are performed.

The initial warm-up alarm (while below the low alarm point) may be disabled until a decrease in temperature of 0.4°C is sensed by the probe.

The theory of operation on a PCB basis is described in the following paragraphs.

PCB 1A

PCB 1A contains the power supply, alarm driver, triac control, and manual control circuits.

POWER SUPPLY

Power for the electronics is supplied through P2, F1, and S1 to the primary of T1. The secondary of T1 is center tapped with approximately 15 V rms across each half of the secondary. The rectified filtered dc voltages across C5 and C6 is +20 and -20 Volts dc. Q11 and CR16 provide a series regulator with an output voltage of +11.3 Volts dc ± 10%. Q12 and CR17 provide a series regulator with an output voltage of -11.3 Volts dc ± 10%.

A +7.8 Volts dc supply voltage is generated by R60, CR18, CR19, and CR23.

ALARM DRIVER CIRCUITS

The alarm driver circuits are described under PCB 2A High-Low Alarm Circuits.

TRIAC CONTROL CIRCUIT

The triac control circuit is described under PCB 2A Phase-Angle Control Circuits.

MANUAL CONTROL CIRCUIT

The manual control circuit is described under PCB 2A Phase-Angle Control Circuit.

PCB 2A

PCB 2A contains the Temperature Measuring Circuit, High-Low Alarm Circuit, Initial Warm-up Low Alarm Disable Circuit and the Phase-Angle Control Circuit.

TEMPERATURE MEASURING CIRCUIT

The infant's temperature is sensed using a temperature probe. The probe is used in conjunction with a bridge circuit consisting of R1 through R4, R84, R85, R95, and R100. The voltage output of the bridge is amplified by IC1, IC2, and fed to the temperature meter, displaying a temperature range of 92°F to 104°F (33.3°C to 40°C).

IC1 is an operational amplifier with a gain of 5. This gain is determined by R5 and R7. The output at pin 6 of IC1 is applied to the input of IC2 and also to the initial warm-up LO-alarm disable circuit via R65.

IC2 is an op-amp used in the inverting mode with an adjustable front panel gain control, R14. The gain range is 30-40 determined by R11, R13, and R14. The output at pin 6 of IC2 is applied to the temperature meter, phase-angle control and HI-LO alarm circuit, and the temperature record circuit.

The voltage at pin 6 of IC2 will be linearly proportional to the temperature being sensed by the temperature probe. Over the display range of 92-104°F (33.3°C to 40°C), the voltage level will be 0-4.8 volts dc. This gives an output/input ratio of 400 millivolts per °F of temperature (716 millivolts per °C).

R15 and R16 divide this 0-4.8 volts dc down to a Zero to 1 volt dc level which is applied to the input of IC3. The output of IC3 is not used.

R17 and R88 provide current limiting to the 1 milliampere full scale meter. When the voltage of pin 6 of IC2 is 4.8 volts dc, R88 is adjusted to give a full scale reading of 104°F (40°C) on the meter.

The output voltage at pin 6 of IC1 will be the output voltage of IC2 divided by 35, assuming 35 is the gain of IC2. This gain may vary between 30 and 40 depending upon the setting of R14. The polarity of the voltage at pin 6 of IC1 is negative over the displayed temperature range of 92-104°F (33.3°C to 40°C).

The output voltage of the bridge circuit's left leg (R1, R3, and R100 and the probe) is typically +320 to +300 millivolts for a temperature range of 92-104°F.

R86 is switched into the bridge via S3A when meter calibration is required or checked to produce sufficient offset for 100°F meter deflection. R87 provides bridge offset to prevent the temperature meter from hitting the left meter stop.

HIGH-LOW ALARM CIRCUITS

The HI-LO alarm circuit consists of IC4, IC6, IC7, IC8, Q7, Q8, Q9, and Q10.

The HI-LO alarms are set to activate at +1°F or -1°F (0.55°C) relative to the control point setting. The control point setting is indicated on the meter face (Red Pointer), and control is provided by R20 and R19. The wiper arm of R20 provides a voltage of 0-4.8 volts dc when the control point is set for 92-104°F (33.3°C to 40°C). This voltage of 0-4.8 volts dc is also at the output pin 6 of IC4. The output of IC4 and the output of IC2 are fed to a comparator amplifier, IC6. The output of IC6 is applied to IC7, the HI alarm voltage comparator, and IC8, the LO alarm voltage comparator. R45 and R46 generate a voltage of approximately _334 millivolts. This is equivalent to a temperature of 1°F (0.55°C). Therefore, when the voltage at pin 6 of IC6 is -334 millivolts or greater, the output of IC8, the LO alarm comparator, will switch from approximately -10 volts dc to +10 volts dc. This voltage will turn on Q10, starting a multivibrator (Q8 and Q9), which drives the visual and audible alarms through Q7. The alarms pulse approximately two (2) times per second (0.3 second ON, and 0.2 second OFF). The audible alarm may be deactivated using S2.

When the voltage at the output of IC6 is within -334 to +334 millivolts, no alarm will be activated. When the voltage at the output of IC6 becomes greater than +334 millivolts, the output of IC7 will switch from -10 to +10 volts dc, again activating the alarms. The alarms are automatically reset when the temperature returns to within $\pm$ 1°F (0.55°C) of the set control point.

The output of IC7, the HI alarm comparator is also fed into the phase angle control circuit. When +10 volts dc is present at the output of IC7, Q4 is switched on. This disables the trigger circuit which feeds the triac, Q6. In effect it turns off power to the heater when the measured temperature reaches 1°F (0.55°C) higher than the control point setting on the meter.

INITIAL WARM-UP LOW-ALARM DISABLE CIRCUIT

One function of the controller provides for disabling the LO-alarm during the initial warm-up of the infant. The circuits which do this are IC9, IC10, IC11, and Q13 through Q21.

The output voltage of IC1 and a fixed bias voltage from R63 is summed and amplified by IC9. The fixed bias is adjusted to give a +2 volts dc output at pin 6 of IC9 while at 77°F (25°C) simulated temperature is provided for the temperature probe. The output voltage of IC9 will be +2 to +8 Volts dc for a sensed temperature of 77°F - 104°F (25 - 40°C). While the initial warm-up phase is proceeding, the maximum positive voltage reached will be stored on C9. IC10, C9, Q13, and Q14 are used in a configuration such that if the output of IC9 decreases from any maximum positive voltage, this peak voltage is stored for a long period of time, and this stored voltage level is available at the emitter of Q14.

This stored temperature voltage (Q14 emitter) and the actual temperature voltage (output of IC9) are fed to a voltage comparator IC11. The output of IC9 is actually the real-time voltage which is changing relative to the sensed temperature. The stored voltage is attenuated through R70 and R71, and is equal to 95% of the maximum peak voltage level reached during the warm-up cycle.

As long as the real-time voltage (temperature) is greater than 95% of the maximum peak stored voltage, the output of IC11 is +10 Volts dc. This +10 volts dc keeps Q15 turned on, which in turn grounds the output of IC8, the LO-alarm comparator, thereby disabling the alarm.

When the initial warm-up period has been completed and the sensed temperature has come to within 1°F (0.55°C) of the control point, Q16 is switched on causing Q15 to turn off. With Q15 off, this allows the LO-alarm circuit to operate in its normal mode.

Q16 is driven from a flip-flop (Q17 and Q18) which serves as a memory. This memory is initially set with Q17 turned on when power is applied to the controller. With Q17 on, Q16 is off, allowing Q15 to disable the LO-alarm. Q19 assures that Q17 is initially turned on by producing an initialization pulse at power-up.

During the initial warm-up, IC8, the LO alarm comparator, output voltage is +10 volts dc. This voltage is sensed by Q20 to determine when the initial warm-up period is over. As the temperature reaches within 1°F (0.55°C) of the control point, IC3's output switches to -10 volts dc. This voltage is sensed by Q20, which in turn resets the flip-flop, turning on Q18, and turning off Q17. Q16 is subsequently switched on, which disables the function of the LO-alarm disable.

However, an additional feature of the overall circuit allows LO-alarm to be activated if the sensed temperature ever falls below 0.4°C of the maximum peak temperature sensed during the initial warm-up period.

If the output voltage of IC9 falls below 95% of the stored voltage, the output of IC11 will switch to -10 volts DC, turning off Q15. This immediately allows the output voltage of IC8 (+10 Volts dc) to activate the alarm. If the temperature returns to the stored level, the LO-alarm again becomes disabled for the remainder of the initial warm-up period.

One other point relative to the alarms; during meter calibration using S3, the alarms are disabled. Q21, Q22, and Q23 do this in conjunction with S3B. Q22 disables the alarms while Q21 and Q23 insure the correct operation of the LO-alarm disable feature after calibration is completed.

PHASE-ANGLE CONTROL CIRCUIT

Power to the heating element is controlled through IC5, Q3, Q4, Q5, and Q6. The output from IC2 and the output from IC4 are fed differentially into IC5. This difference in input voltage from the real-time temperature and the control point setting is amplified by a gain of 5. A bias voltage is also generated by R21, R22, and R89. This bias voltage sets the initial conduction phase-angle for the triac, Q6.

The output voltage at pin 6 of IC5 is approximately +9 volts dc and will change several volts either direction, depending upon the amount of power required to warm the infant. This output voltage and a fixed voltage of approximately +8.5 Volts dc at the emitter of Q2 controls the amount of current which charges the capacitor, C1.

When the voltage level on the capacitor reaches approximately +6.8 volts dc the unijunction transistor will trigger and discharge the capacitor into the pulse transformer T2, which triggers the triac into conduction.

Q4 and Q5 are used to reset the charge on C1 at the beginning of each half cycle of the input voltage (60 Hz). Initial setup of the conduction phase-angle is done by setting the control point to 98°F (36.7°C) and simulating a 98°F (36.7°C) temperature. R22 is adjusted to a 50% conduction angle for the triac.

The band width control of the phase-angle is set by the gain of IC5. Full power (90%) is applied when the sensed temperature is -0.5°F (.27°C) from set point, and 10% power when the sensed temperature is +0.25°F from the set point.

The manual control of the heater is provided by Q1. This is a constant current source which may be varied through R28. The various levels of current charge C1 at different rates thereby changing the conduction phase-angle of the triac.

3.2.5 SERVO CONTROLLER (SC78-2) (REFER TO FIGURES 7.3, 7.6, AND 7.7)

The SC78-2 Servo Controller utilizes a skin temperature probe which is attached to the infant, to sense the skin temperature of the infant. The skin temperature is displayed on a front panel meter which contains a temperature control

point indicator. The control point is adjustable to the temperature prescribed by the attending physician. The sensed skin temperature is relayed to the controller which proportionally increases or decreases the warmer module heater output to maintain the prescribed skin temperature.

A flashing indication and an audible alarm will automatically occur if the infant's temperature deviates ± 1°C (1.8°F) from the preset control point. Both alarms are automatically disabled for 15 minutes during initial warmup of the infant (initiated by turning the unit on).

The alarms can also be disabled for fifteen minutes by depressing the SILENCE Switch only when the infant's temperature is not within the control band. Depressing the SILENCE Switch during an existing fifteen minute disable period will not add an additional fifteen minutes.

The alarm condition will occur as follows:

Initial placement of a "cold infant" whose temperature is more than 1°C (1.8°F) below the control point, will illuminate the ALARM indicator steady-on when power is turned on. The audible alarm will be silent. If during the fifteen minute silence period the infant's temperature reaches the control point, the indicator will go out. If the cold infant is still more than 1°C (1.8°F) below the control point after 15 minutes the alarm will sound and the light will flash.

If the infant's temperature fails to reach the control point within 15 minutes or reaches it then deviates ± 1°C (1.8°F) from the control point at any time, the ALARM Indicator will flash and the audible alarm will sound. If the infant's skin temperature returns to the control point after a momentary deviation (for example: if the skin temperature probe is momentarily exposed to normal air temperature) both alarms would continue to function. Depressing the SILENCE Switch will silence the audible alarm and illuminate the ALARM Indicator steady-on for a fifteen minute SILENCE period if the alarm condition still exists. If it does not still exist, the lamp will go out.

The theory of operation on a PCB basis is described in the following paragraphs.

PCB 1A

PCB 1 contains the power supply circuit.

POWER SUPPLY

The power for the electronics is supplied through P2, F1, and S1 to the primary of T1. The secondary of T1 is center tapped with approximately 15 V rms across each half of the secondary. The rectified filtered DC voltage across C5 and C6 is +20 and -20 volts dc. The Q11 and CR16 provide a series regulator with an output voltage of +11.3 volts dc ± 10%. Q12 and CR17 provide a series regulator with an output voltage of -11.3 volts dc ± 10%.

A +7.8 volts dc supply voltage is generated by CR2, CR3, and CR4. A +15 volts dc supply voltage is generated by CR2.

PCB 2A

PCB 2A contains the Temperature Measuring Circuit, Alarm Circuit, and the Phase-Angle Control Circuit.

TEMPERATURE MEASURING CIRCUIT

The infant's temperature is sensed using a temperature probe. The probe is used in conjunction with a bridge circuit consisting of R1, R3 through R9. The voltage output of the bridge is amplified by IC1, IC2, and fed to the temperature meter, displaying a temperature range of 92°F to 104°F (33.3°C to 40°C).

IC1 is an operational amplifier with a gain of 5. This gain is determined by R10, and R12. The output at pin 6 of IC1 is applied to the input of IC2 and also to the initial warm-up delay circuit.

IC2 is an op-amp used in the inverting mode with an adjustable front panel gain control, R14. The gain range is 30-40 determined by R16, R19, R62 on PCB 2 and R14 on Front Panel. The output at pin 6 of IC2 is applied to the temperature Meter, Phase-Angle Control and Alarm Circuit, and IC3.

The voltage at pin 6 of IC2 will be linearly proportional to the temperature being sensed by the temperature probe. Over the display range of 92-104°F (33.3°C to 40°C), the voltage level will be 0-4.8 volts dc. This gives an output/input ratio of 400 millivolts per °F of temperature (716 millivolts per °C).

R19 and R63 provide current limiting to the 1 milliampere full scale meter. When the voltage of pin 6 of IC2 is 4.8 volts dc, R63 is adjusted to give a full scale reading of 104°F (40°C) on the meter.

The output voltage at pin 6 of IC1 will be the output voltage of IC2 divided by 35, assuming 35 is the gain of IC2. This gain may vary between 30 and 40 depending upon the setting of R14. The polarity of the voltage at pin 6 of IC1 is negative over the displayed temperature range of 92-104°F (33.3°C to 40°C).

The output voltage of the bridge circuit's left leg (R1, R3, and R4 and the probe) is typically +320 to +300 millivolts for a temperature range of 92-104°F (33.3°C to 40°C). The right leg's output is set at approximately +300 millivolts and remains fixed.

R2 is switched into the bridge via S3 when meter calibration is required or checked to produce sufficient offset for 100°F meter deflection. R87 provides bridge offset to prevent the temperature meter from hitting the left meter stop.

ALARM CIRCUIT

The alarm circuit consists of an oscillator circuit, momentary silence, and circuitry which controls the audible ALARM and ALARM Indicator. The alarm circuit functions in three modes:

- NORMAL--ALARM indicator and audible ALARM OFF.
- SILENCE--ALARM indicator ON and audible ALARM OFF.
- ALARM--ALARM indicator FLASHING and audible ALARM ON.

The oscillator IC13 produces a clock pulse of approximately 1.3 Hz at TP3. A ripple binary counter IC11 uses the negative going clock pulse to advance one step in binary order, and when the count has reached the equivalent of 12.5 $\pm$ 2.5 minutes a high output is produced.

The high and low alarms are set to activate at $\pm$ 1°C (1.8°F) relative to the control point setting. The control point setting is indicated on the meter face, and control is provided by R20 and R30. The wiper arm of R20 provides a voltage of 0-4.8 volts dc when the control point is set for 92-104°F (33.3°C to 40°C). This voltage of 0-4.8 volts dc is also at the output pin 6 of IC4 (TP2). The output of IC4 and the output of IC2 are fed to operational amplifier comparator IC6. The output of IC6 is applied to IC7, the high/low alarm comparator. The high alarm comparator (IC7 pin 4) produces an - 11.0 volt signal at or above the 1°C alarm points. Similarly, the low alarm comparator (IC7 pin 6) produces an - 11.0 volt signal at or below the alarm point. The output of IC7 is applied to NAND gate circuitry (IC8) and dual peripheral driver (IC12). A low at the input of the drive produces a high output and inhibits the alarm.

The NORMAL mode occurs when the following conditions exist:

- When the SILENCE switch is activated while the temperature is within the control band.
- Temperature returns to the control band while in SILENCE mode.

The output IC8-3 is low, IC8-4 is high, IC9-11 is low, and IC9-10 is high, producing a reset to IC11 and a low to IC12.

The SILENCE mode occurs when the following conditions exist:

- Unit is first turned on.
- The SILENCE switch is activated while the temperature is not within the control band.
- The METER CAL Switch is depressed.

When the power is initially turned on, capacitors C6 and C9 are discharged. This low produces a high output of IC9-4 and a low output of IC9-3. IC9-11 is hogh to IC10-1, producing a low at IC8-8. The high output IC8-10 in conjunction with a high at IC8-3 input IC12 causing the ALARM lamp to be illuminated continuously. Also, the high at IC9-11 produces a high at IC9-10; this high resets the counter IC11 thereby commencing the 15 minute delay. When the unit is functioning normal and the 15 minute delay has elapsed, depressing the SILENCE Switch or the METER CAL Switch discharges capacitors C6 and C9 restarting a new 15 minute silence period.

NOTE: The 15 minute ALARM silence is NOT retriggerable; the operator cannot ADD another 15 minute period by depressing SILENCE during a previously initiated 15 minute silence period.

The ALARM mode occurs when the following conditions exist:

- Temperature not within the control band.
- Temperature enters, then leaves the control band during 15 minute silence.
- Temperature remains out of the control band more than 15 minutes after silence initialization.

When an alarm condition occurs, the output of IC8-3 goes high producing a low output at IC8-11. This low, in conjunction with a low at IC9-11, causes IC10-3 to go high. IC8-10 will go low at the clock rate. The high from IC8-3 and the intermittent high at IC8-10 goes to IC12 causing the ALARM Indicator to flash. The high from IC10-3 and the intermittent high from IC8-10 causes the audible alarm to sound.

The ALARM mode will continue, once it has commenced, until either the SILENCE switch is depressed, or the input power is interrupted.

PHASE-ANGLE CONTROL CIRCUIT

Power to the heating element is controlled through IC5, Q1, Q2, Q3, Q4, and Q6. The output from IC2 and the output from IC4 are fed differentially into IC5. This difference in input voltage from the real-time temperature and the control point setting is amplified by a gain of 5. A bias voltage is also generated by R21, R22, and R23. This bias voltage sets the initial conduction phase-angle for the triac, Q6.

The output voltage at pin 6 of IC5 is approximately +9 volts dc and will change several volts in either direction, depending upon the amount of power required to warm the infant. This output voltage and a fixed voltage of approximately +8.5 volts dc at the emitter of Q1 controls the amoung of current which charges the capacator, C3.

When the voltage level on the capacitor reaches approximately +6.8 volts dc the unijunction transistor (Q4) will discharge C3 into the pulse transformer T2, which triggers the triac into conduction.

Q2 and Q3 are used to line sync and discharge C3 at the beginning of each half cycle of the input voltage (60 Hz). Initial setup of the conduction phase-angle is done by setting the control point to 98°F (36.7°C) and simulating a 98°F (36.7°C) temperature. R22 is adjusted to a 90°F (32.3°C) conduction angle for the triac.

The band width control of the phase-angle is set by the gain of IC5. Full power (90%) is applied when the sensed temperature is -0.5°F (0.27°C) from setpoint, and 10% when the sensed temperature is +0.25°F from the setpoint.

3.2.6 RESUSCITATION/ASPIRATION SYSTEM

The Resuscitation/aspiration component of the Infant Care System consists of a Resuscitation System and an Aspiration System which regulate and deliver these services to the foot end of the bassinet for administration to the infant. The Infant Care System has the following options.

- Resuscitation
- Resuscitation with Aspiration
- Aspiration

This system is not part of the Mobile Infant Warmer.

RESUSCITATION SYSTEM

The Resuscitation System (Figure 3.1) accepts oxygen from a wall source or from two D or E oxygen cylinders. A preset pressure regulator maintains a pressure of 50 PSI from the oxygen cylinders to the flowmeter. If the system uses oxygen from a wall source, either of two options exist: oxygen can bypass the oxygen cylinders and regulator, but leaves the cylinder system available for emergency use; or the oxygen is applied directly to the flowmeter. The flowmeter is adjustable from 0 to 10 LPM and is backpressure compensated (e.g. variations in pressure on the output of the flowmeter will not affect the accuracy of the flowmeter reading). The rate of flow is determined by the top of the float in the flowmeter. The output of the flowmeter goes to the AMBU® connection. If humidification is required, the AMBU® can be replaced by a humidifier.

RESUSCITATION WITH ASPIRATION SYSTEM

The Resuscitation/Aspiration System consists of a resuscitation System (Figure 3.1) and an Aspiration System which is connected to the input fo the flowmeter. The Aspiration System operates from either the oxygen cylinders or a wall source of oxygen. The system employs a built-in venturi which creates a vacuum at the patient aspiration tube. The amount of vacuum is adjusted by a needle valve to a minimum pressure gauge reading of at least 7.9 inches (20 cm Hg). An appropriate suction catheter is connected to the patient end of the aspirator tubing.

ASPIRATION SYSTEM

The Aspiration System (Figure 3.2) is connected to a conventional wall vacuum source of 20 inches (50.8 cm Hg). The amount of vacuum is adjusted by a needle valve to the desired pressure. An appropriate suction catheter is connected to the patient end of the aspirator tubing.

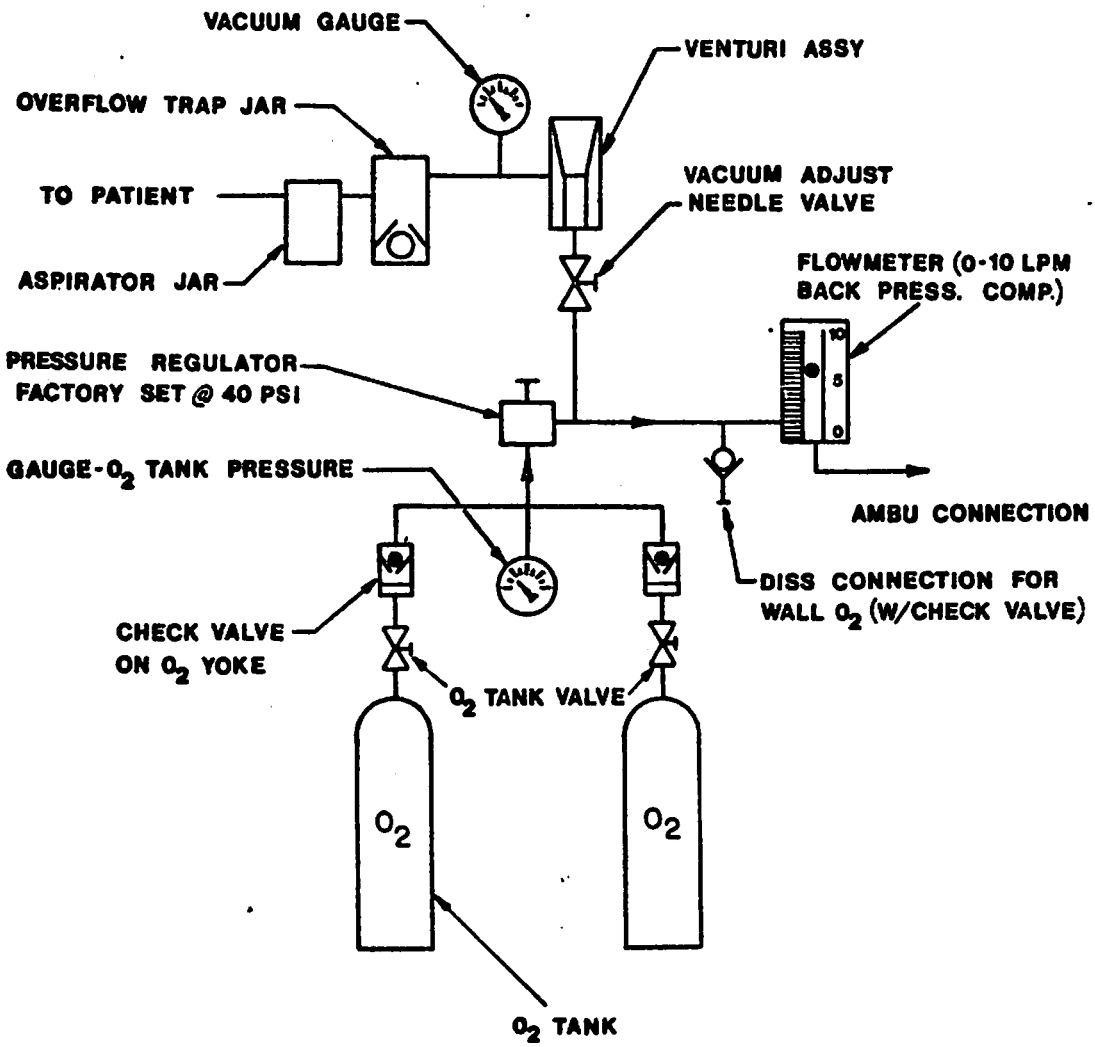

FIGURE 3.1 TYPICAL RESUSCITATION/ASPIRATION SYSTEM

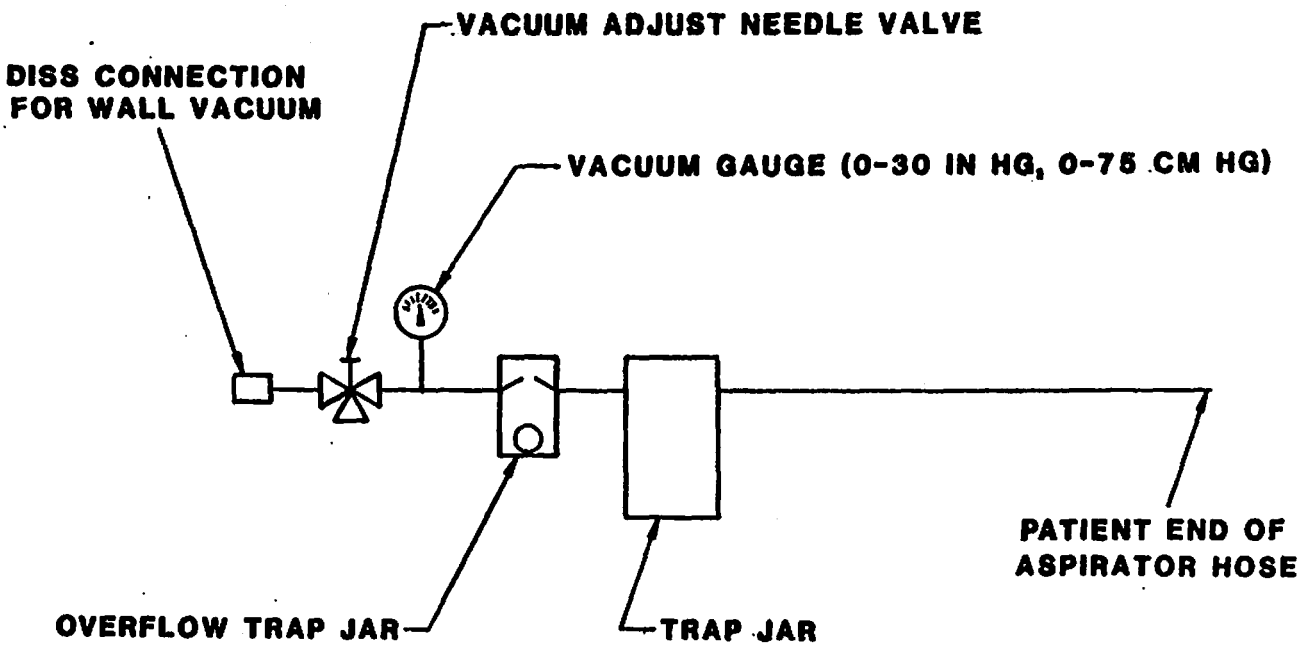
VACUUM ADJUST NEEDLE VALVE
DISS CONNECTION FOR WALL VACUUM
VACUUM GAUGE (0-30 IN HG, 0-75 CM HG)
PATIENT END OF ASPIRATOR HOSE
OVERFLOW TRAP JAR
TRAP JAR

FIGURE 3.2 TYPICAL ASPIRATION SYSTEM

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SECTION 4
PREVENTIVE MAINTENANCE

4.1 GENERAL

This section provides preventive maintenance procedures for the Air-Shields® Infant Care System and the Air-Shields® Mobile Infant Warmer. Included are routine cleaning instructions and a recommended calibration procedures.

4.2 CLEANING AND STERILIZATION

4.2.1 GENERAL CLEANING

The Infant Care System can be cleaned as the unit is disassembled or reassembled. Refer to paragraph 5.4 for Repair and Replacement Procedures. The Mobile Infant Warmer does not require disassembly for cleaning.

> CAUTION: Unplug power cord from wall receptacle. Disconnect oxygen from wall sources. Close oxygen cylinders.

> CAUTION: Do not autoclave Plexiglas, plastic, or glass components and assemblies containing these components. Do not use alcohol or cold chemical germicidal cleaners on Plexiglas.

When an infant is discharged, or at least once a week, the Infant Care System should be cleaned and disinfected thoroughly. An iodophor or quaternary ammonium disinfectant detergent should be used. Air-Shields® Kleenaseptic® Germicidal Surface Cleaner can be used to clean all Plexiglas, plastic glass, metal, and painted metal surfaces. Air-Shiels® Vapaseptic® Air Sanitizer can be used to sanitize all surfaces cleansed with Kleenaseptic® Germicidal Surface Cleaner. Cleaning can also be accomplished by using a detergent germicidal solution, rinsing in warm water, and drying thoroughly.

4.2.2 STERILIZATION

Sterilization can be accomplished with the following agents.

- Autoclaving

> CAUTION: Do not steam autoclave Plexiglas, plastic, or glass components and assemblies containing these components.

- Gas Sterilization

Ethylene Oxide Gas can be used at a temperature of 60° (140°F). Follow the ETO manufacturer's recommendations for proper aeration.

4.3 RECOMMENDED CALIBRATION SCHEDULE

It is recommended that the Servo Controller (SC78-1 and SC78-2) be completely calibrated at least once every four months to six months as described in Section 5 of this Manual.

It is also recommended that the Resuscitation/Aspiration System be completely calibrated at least once every month as described in Section 5 of this Manual.

SECTION 5
SERVICE

5.1 GENERAL

This section provides calibration, troubleshooting, and removal replacement instruction for the following units comprising the Air-Shields Infant Care System and the Air-Shields Mobile Infant Warmer.

- Manual Controller
- Servo Controller (SC78-1)
- Servo Controller (SC78-2)
- Resuscitation and Aspiration Systems

For procedures to calibrate, troubleshoot, and disassemble the Twin-O-Vac, consult the Twin-O-Vac Service Instructions.

5.2 CALIBRATION AND TEST PROCEDURES

5.2.1 GENERAL

This paragraph provides calibration procedures for the units of the Infant Care System and Mobile Infant Warmer listed in paragraph 5.1. Unless otherwise indicated, calibration procedures on the controllers are performed under the following conditions.

1. The unit is removed from the warmer module post.
2. The unit's cover is removed.
3. The unit is connected to a primary power source of the correct voltage and frequency (see rear panel of unit under test).
4. The POWER pushbutton is in the ON position.

5.2.2 TEST EQUIPMENT REQUIRED

The test equipment listed below is required for calibration of the units listed in paragraph 5.1. Equivalent test equipment may be substituted.

Oscilloscope - Tektronic 561A
Scope Probe 10X
Leakage Tester - Cambridge Instrument Co. Type 01017
Digital Voltmeter Fluke 8000A
Load Simulator - Heater or incandescent lamp (rated at 600 watts or less)
Temperature Calibration Box, Part Number 26 962 71
Variac - General Radio 5MT3A
Pressure Gauge Assembly, Part Number 20 090 72
Flowmeter, Part Number 78 400 30

5.2.3 TEST POINT AND ADJUSTMENT LOCATIONS

Location of test points and adjustment for the Servo Controllers Models SC78-1 and SC78-2 are illustrated in Figures 5.1 and 5.3.

5.2.4 MANUAL CONTROLLER CALIBRATION

TEST SETUP.

1. Attach load Simulator to output of controller.

2. Attach an ungrounded oscilloscope to load using 10X probe.

PROCEDURE.

Using TEMPERATURE control (R1), rotate from MIN to MAX while observing the waveform. The waveform should vary from 0° conduction angle to a 180° conduction angle.

5.2.5 MANUAL CONTROLLER LEAKAGE TEST

TEST SETUP.

Connect the controller to a primary power source through an ungrounded adapter plug, so that the unit is ungrounded.

The leakage test standards provided in the procedure below assume leakage through a resistance of 1000 ohms. If the Leakage Tester being used does not provide this resistance, the test setup must be adjusted to provide it.

PROCEDURE.

1. Use the Leakage Tester to measure between the chassis of the unit under test and a known ground such as the ground connection of a wall receptacle. The leakage must not exceed 50 microamps.

2. Reverse the plug and repeat step 1.

3. Repeat steps 1 and 2 with the Controller Power Switch off.

5.2.6 SERVO CONTROLLER (SC78-1) POWER SUPPLY TESTS

TEST SETUP.

Connect test equipment as described below:

120 Vac units: use variac to apply 108 Vac to unit under test

PROCEDURE.

Using a digital voltmeter, check for correct dc voltages $\pm$ 10% as shown below. All voltage test points are on PCB 2. Refer to Figure 5.1 for location of test points.

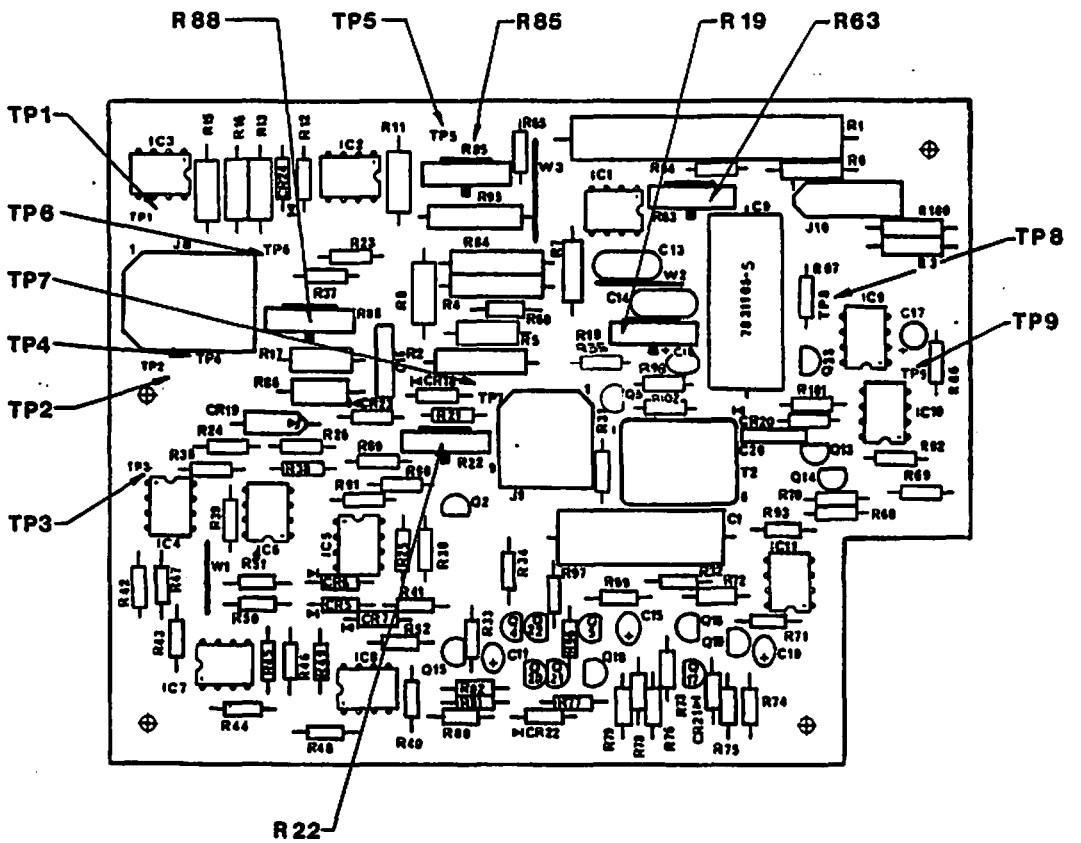


FIGURE 5.1 TEST POINT AND ADJUSTMENT LOCATIONS
PCB2A SERVO CONTROLLER (SC78-1)

TEST POINT	VOLTAGE
TP-2	-11 Vdc ± 10% -11.4
TP-5	+11 Vdc ± 10% +11.7
TP-8	ground (circuit)
TP-4	ground (circuit)
TP-7	+7.8 ± .075 Vdc 7.77

5.2.7 SERVO CONTROLLER (SC78-1) TEMPERATURE MEASURING ADJUSTMENT

TEST SETUP.

1✓ Plug the Temperature Calibration Box into the PATIENT PROBE jack J4 and set TEMP. SEL switch on Calibration Box to C.P.

2. Set R14 (CAL ONLY) on the front panel of Servo Controller to Mid-range.

3. Turn the Servo Controller ON. Connect DVM to TP-6 and ground (TP-4). Rotate R85 on PCB 2 fully clockwise. Rotate pot on Calibration Box to provide a 4.80 volts dc ± 0.05 output at TP6. (If unable to obtain 4.8 Vdc, back off R85.)

PROCEDURE.

1✓ Adjust R88 on PCB2A for Controller Meter indication of 104°F (40°C).

2. Simulate a probe resistance equivalent to 93.2°F (34°C) on the Calibration Box. Adjust R85 on PCB2A to read 93.2°F (34°C) on the controller TEMPERATURE Meter.

3. Simulate a probe resistance equivalent to 102.2°F (39°C) on the Calibration Box. Adjust R14 (CAL ONLY) on front panel to read 102.2°F (39°C) on the controller TEMPERATURE meter.

4. Repeat 2 and 3 if necessary.

5. Verify a 100°F (37.8°C) reading when METER CAL switch on the front panel is activated.

6. Place the Calibration Box in the C.P. position. Check the output of TP-1 on PCB2A and Temperature Recorder (J3-1 & 6). Vary the Calibration Box Control so that the TEMPERATURE meter varies from 92°F to 104°F (33.3°C to 40°C). This should vary from 0 to 1 Volts (± 0.05) dc when the temperature changes from 92°F to 104°F (33.3°C to 40°C).

5.2.8 SERVO CONTROLLER (SC78-1) ALARM CIRCUIT CALIBRATION

TEST SETUP.

Plug the Temperature Calibration Box into the PATIENT PROBE jack and set TEMP SEL switch to C.P.

PROCEDURE.

1. Set the Calibration Box CONTROL POINT Control for 98°F (36.7°C) on the controller readout. Set CONTROL POINT for 98°F (36.7°C). Determine voltage with DVM at TP-6. Connect DVM to TP-3. Adjust R19 for DVM readout equal to that of TP-6 within ± 0.05 VDC.

2. Determine that the alarms activate at ± 1°F (.55°C) (tolerance ± 0.2°) of CONTROL POINT by varying the Calibration Box Control. If alarm is out of tolerance, adjust R19. Check alarm at 96°F (35.5°C) and 100°F (37.8°C), readjust R19 if necessary. Check the operation of the audio OFF-ON switch.

5.2.9 SERVO CONTROLLER (SC78-1) INITIAL WARM-UP LO-ALARM DISABLE TEST

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack and set TEMP SEL switch to C.P.

PROCEDURE.

1. With the Calibration Box set at 25°C (77°F), connect DVM to TP-9 on PCB2A Adjust R63 for a +2.0 Volts dc (± 0.05) indication on the DVM.

2. Set the variable pot on the Calibration Box to the minimum temperature setting.

3. Turn controller power OFF and back ON. Set the CONTROL POINT to 98°F (36.7°C).

4. The alarms should not activate.

5. Place the Calibration Box in the C.P. position. Slowly increase the simulated temperature on the Calibration Box. When the temperature indication on the controller comes within 2.0°F (1°C) of the CONTROL POINT, this circuit becomes disabled and the alarms will function normally.

6. Turn power OFF and reset the temperature control on the Calibration Box to minimum. Turn controller back ON.

7. Slowly increase the simulated temperature on the control box. Then decrease it before reaching circuit cut-off. If the temperature drops approximately 0.9°F (0.4°C) during initial warm-up, the alarms should activate. These alarms should cancel when the temperature is again increased to the peak temperature.

8. This circuit will also cancel the alarms when S3 (METER CAL) is depressed.

5.2.10 SERVO CONTROLLER (SC78-1) PHASE ANGLE CONTROL ADJUSTMENT

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack and set TEMP SEL switch to C.P.

2. Plug in the simulated load.

3. Connect the UNGROUNDED scope across the load. Use 10X probe and line sync.

4. Adjust the scope for 1 ms/Div.

5. Set the Calibration Box to CP and increase temperature until the Controller TEMPERATURE Meter indicates 98°F (36.7°C), also set the CONTROL POINT to 98°F (36.7°C).

PROCEDURE.

1. Display the entire positive load voltage on 10 divisions of the oscilloscope (Figure 5.2), vary the horizontal vernur control if necessary. Adjust R22 for a conduction angle of 5 divisions.

2. Check operation of manual control. Output of heater should vary from 0 to full power. If the infant is being monitored, the ISC will override the manual operation at the upper alarm limit.

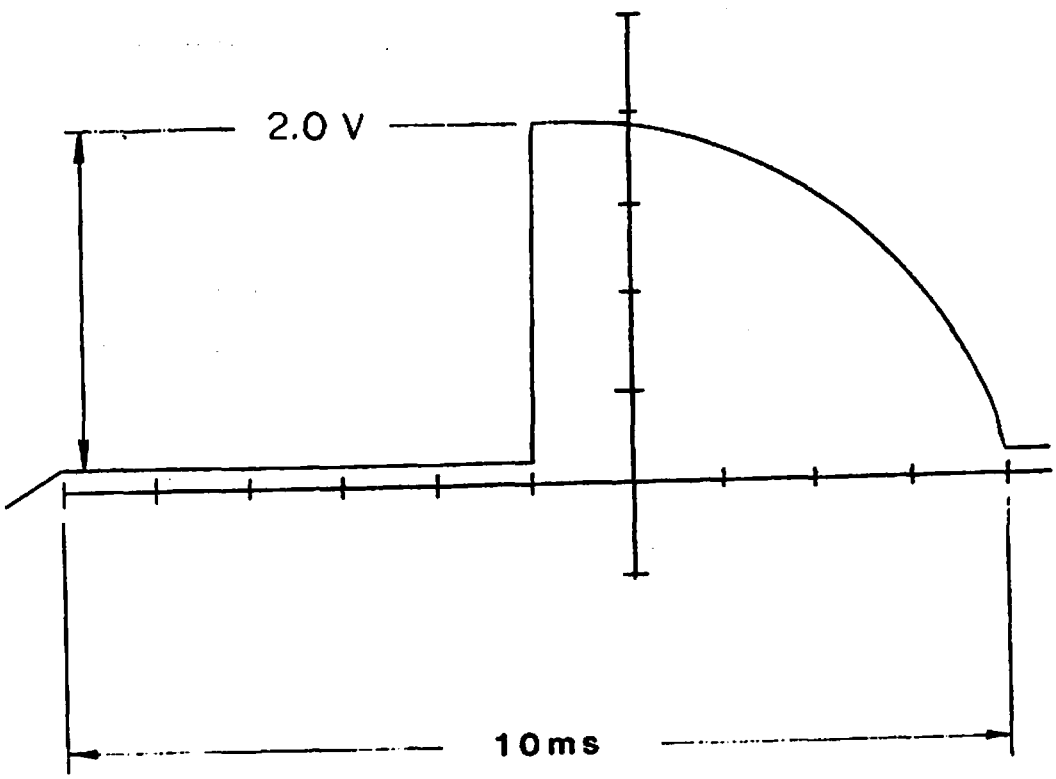


FIGURE 5.2 CONTROLLER PHASE CONDUCTION ANGLE

5.2.11 SERVO CONTROLLER (SC78-1) LEAKAGE TEST

TEST SETUP.

The Leakage Test for the SC78-1 is identical to the Manual Controller. It is presented again as a convenience to the user.

Connect the controller to a primary power source through an ungrounded adapter plug, so that the unit is ungrounded.

The leakage test standards provided in the procedure below assume leakage through a resistance of 1000 ohms. If the Leakage Tester being used does not provide this resistance, the test setup must be adjusted to provide it.

PROCEDURE.

1. Use the Leakage Tester to measure between the chassis of the unit under test and a known ground such as the ground connection of a wall receptacle. The leakage must not exceed 50 microamps.

2. Reverse the plug and repeat step 1.

3. Repeat steps 1 and 2 with the Controller Power Switch off.

5.2.12 SERVO CONTROLLER (SC78-2) POWER SUPPLY TESTS

TEST SETUP.

Connect test equipment as described below:

120 Vac units: use variac to apply
108 Vac to unit under test.

PROCEDURE.

Using a digital voltmeter, check for correct dc voltages ± 10% as shown below. All voltage test points are on PCB 2. Use the chassis as a ground. Refer to Figure 5.3 for location of test points.

TEST POINT	VOLTAGE
TP-5	-11 Vdc ± 10%
TP4	+11 Vdc ± 10%
TP7	+15 Vdc ± 10%
TP6	+7.5 Vdc ± 15%

5.2.13 SERVO CONTROLLER (SC78-2) CLOCK FREQUENCY TEST

TEST SETUP.

1. Attach the oscilloscope probe to TP3 on PCB2A and the common to the chassis.

2. Adjust the Variac to a line voltage ± 5% with the POWER switch in the ON position.

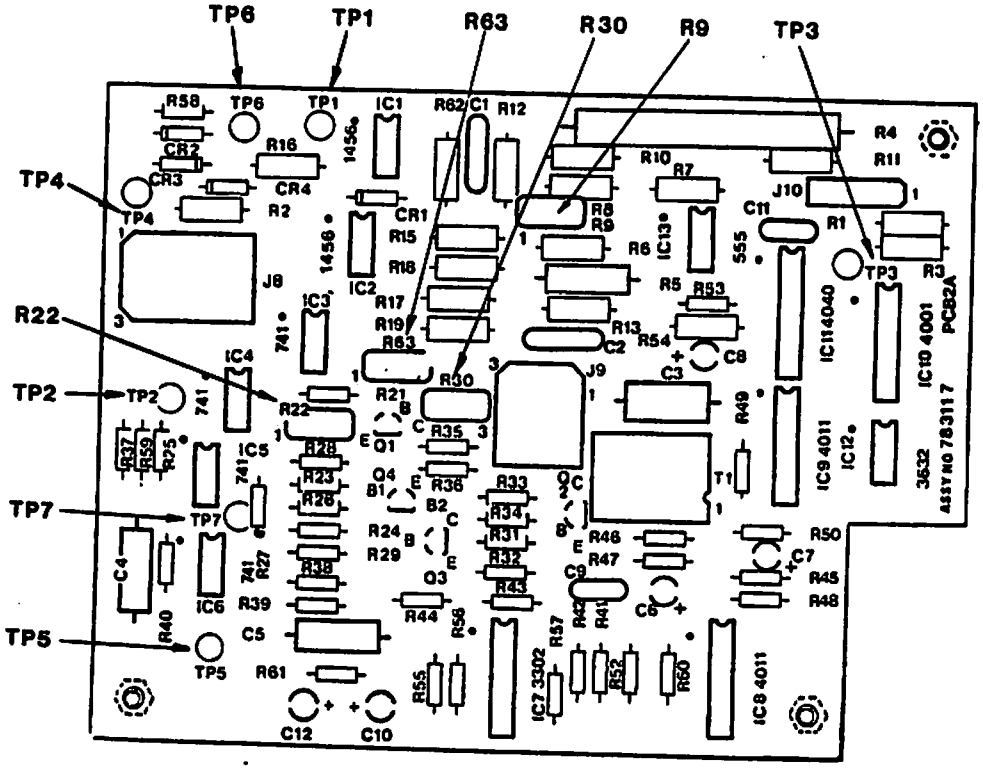


FIGURE 5.3 TEST POINT AND ADJUSTMENT LOCATIONS
PCB2A SERVO CONTROLLER (SC78-2)

PROCEDURE.

Measure time for one full cycle:

Minimum: 580 ms
Maximum: 880 ms
Duty Cycle: 50 ± 20%

5.2.14 SERVO CONTROLLER (SC78-2) TEMPERATURE MEASURING ADJUSTMENT

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack J4 and set TEMP SEL switch on Calibration Box C.P.

2. Set R14 (CAL ONLY) on the front panel of Servo Controller to Mid-range.

3. Turn the Servo Controller ON. Connect DVM to TP-1 and the chassis. Rotate R9 on PCB 2 fully clockwise. Rotate the CONTROL POINT Control on Calibration Box to provide a 4.8 Volts dc ± 0.05 output at TP1. (If unable to obtain 4.8 Vdc, back off R9.)

PROCEDURE.

1. Adjust R63 on PCB2A for controller meter indication of 104°F (40°C)

2. Set the TEMP SEL switch on the Calibration Box to 93.2°F (34°C). Adjust R9 on PCB2A for a reading of 34°C on the controller TEMPERATURE meter.

3. On the Calibration Box, set the TEMP SEL switch to 39°C. On the controler, set the CAL ONLY control for 39°C on the TEMPERATURE meter.

4. Repeat 2 and 3 if necessary.

5. Verify a 100°F (37.8°C) reading when METER CAL switch on the front panel is activated.

5.4.15 SERVO CONTROLLER (SC78-2) ALARM CIRCUIT CALIBRATION

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack J4 and set TEMP SEL switch on Calibration Box to C.P.

2. Set R14 (CAL ONLY) on the front panel of Servo Controller to Mid-range.

PROCEDURE.

1. Set Calibration Box to C.P. and increase the CONTROL POINT control until the Controller TEMPERATURE Meter indicates 98.6°F (37°C).

2. Rotate R20 (CONT POINT) for a reading of 98.6°F (37°C) on the Servo Controller.

3. Connect a DVM between TP1 and TP2 (positive lead) on PCB2A.

4. Adjust R30 for a 0.00 (± 0.01) Vdc on the DVM.

5. Rotate CONTROL POINT control on Calibration Box. The alarms should activate at 36 (± 0.4) °C and 38 (± 0.4) °C. If necessary, adjust R30.

5.2.16 SERVO CONTROLLER (SC78-2) PHASE ANGLE CONTROL ADJUSTMENT

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack J4 and set TEMP·SEL switch on Calibration Box to C.P.

2. Set R14 (CAL ONLY) on the front panel of Servo Controller to Mid-range.

3. Plug in the simulated load.

4. Connect the ungrounded scope across the load. Use 10X probe.

5. Adjust the scope for 1 ms/Div.

6. Set the Calibration Box to CP and increase temperature until the Controller TEMPERATURE Meter indicates 98°F (36.7°C), also set the CONTROL POINT to 98°F (36.7°C).

PROCEDURE.

1. Adjust CONTROL POINT for a 98°F (36.7°C) indication.

2. Set R20 (CONT POINT) for a reading of 98°F (36.7°C) on the Servo Controller.

3. Adjust R22 on PCB 2A for a Conduction angle of 5 divisions (Figure 5.2) on the oscilloscope.

5.2.17 SERVO CONTROLLER (SC78-2) ALARM DELAY ADJUSTMENT

TEST SETUP.

1. Plug the Temperature Calibration Box into the PATIENT PROBE jack and set the TEMP CAL switch on the Calibration Box to C.P. Set the CONTROL POINT control to minimum. Turn OFF the Servo Controller.

PROCEDURE.

1. Adjust the CONT POINT (R20) on the Servo Controller to 98.6°F (37°C).

2. Turn the Servo Controller ON. The ALARM lamp should be illuminated and the audible ALARM silent.

3. On the Calibration Box increase the CONTROL POINT control until the ALARM lamp is just extinguished, the Meter (M1) reading should be 96.8°F ± 0.72°F (36 ± 0.4°C).

4. Increase the CONTROL POINT control on the Calibration Box temperature until the Servo Meter (M1) reads 98.6°F (37°C), turn the Servo Controller OFF then ON. The ALARM lamp should remain off.

5. Increase the Control Point control until the ALARM lamp just starts to flash and the audible ALARM sounds. The Servo Meter (M1) reading should be 100.4°F ± 0.72°F (38 ± 0.4°C).

6. Rotate the CONTROL POINT control on the Calibration Box over its entire range. The ALARM lamp should not stop flashing and the audible ALARM should not stop.

7. Adjust CONTROL POINT control until the Controller TEMPERATURE Meter indicates 95°F (35°C). On the Servo Controller depress the ALARM SILENCE switch; the ALARM lamp will illuminate and audible ALARM should stop for a period of 12.5 ± 2.5 minutes.

5.2.18 SERVO CONTROLLER (SC78-2) LEAKAGE TEST

TEST SETUP.

The Leakage Test for the SC78-2 is identical to the Manual and SC78-1 Controllers. It is presented here as a matter of convenience to the user.

Connect the controller to a primary power source through an ungrounded adapter plug, so that the unit is ungrounded.

The leakage test standards provided in the procedure below assume leakage through a resistance of 1000 ohms. If the Leakage Test being used does not provide this resistance, the test setup must be adjusted to provide it.

PROCEDURE.

1. Use the Leakage Tester to measure between the chassis of the unit under test and a known ground such as the ground connection of a wall receptacle. The leakage must not exceed 50 microamps.

2. Reverse the plug and repeat step 1.

3. Repeat steps 1 and 2 with the Controller Power Switch off.

5.2.19 RESUSCITATION SYSTEM WITH TANKS

TEST SETUP.

1. Close the needle valve on the flowmeter.

   NOTE: The needle valve must be turned clockwise to close. Use care not to over-tighten.

2. Place an Oxygen cylinder in one of the oxygen yokes.

3. Pressurize the system by opening the cylinder valve slowly. The minimum pressure on the pressure gauge should be 500 psi.

PROCEDURE.

1. Close the cylinder valve and remove the oxygen cylinder from the yoke.

2. The pressure shown on the pressure gauge should remain stable for at least five minutes.

3. Open the cylinder valve to bleed the system.

4. Repeat Test Setup using the other yoke, then repeat steps 1, 2, and 3.

5. Place the oxygen cylinder in one of the yokes and pressurize the system.

6. Attach a pressure gauge to the flowmeter output.

7. Fully open the flowmeter valve. Observe the added pressure gauge, the reading should be 40 $\pm$ 2.5 psi.

8. Close the oxygen cylinder and remove the cylinder from the yoke.

9. Attach oxygen wall source of at least 50 psi (+0, -1) to the DISS Oxygen inlet.

10. Open the flowmeter needle-valve to 10 lpm and verify that no leakage occurs at the oxygen check valves.

> NOTE: Leakage might occur when the flowmeter is first opened, but should stop after a few seconds.

11. Reduce the flowmeter to 8 lpm. Attach a flowmeter to the output of the units flowmeter.

12. The attached flowmeter should read 7.5 to 8.5 lpm.

5.2.20 RESUSCITATION SYSTEM WITHOUT TANKS

TEST SETUP.

1. Close the needle valve on the flowmeter.

> NOTE: The needlve valve must be turned clockwise to close. Use care not to over-tighten.

2. Attach a wall source of at least 50 - 60 psi to the DISS Oxygen inlet.

PROCEDURE.

1. Open the flowmeter needle-valve to 10 lpm and verify that no leakage occurs at the oxygen check valves.

NOTE: Leakage might occur when the flowmeter is first opened, but should stop after a few seconds.

2. Reduce the flowmeter to 8 lpm. Attach a flowmeter to the output of the flowmeter.

3. The attached flowmeter should read 7.5 to 8.5 lpm.

5.2.21 ASPIRATION SYSTEM

TEST SETUP.

1. Attach a vacuum wall source of 20 inches (50.8 cm) of Hg to the vacuum DISS input.

2. Set the vacuum needle valve for maximum suction.

3. Attach a patient tube and occlude.

PROCEDURE.

1. Observe the vacuum gauge on the aspiration system, it should read the same as the vacuum source gauge.

2. Adjust the vacuum needle valve to reduce the vacuum, the vacuum gauge on the aspiration system should be able to be reduced to zero.

5.2.22 VENTURI ASPIRATOR

TEST SETUP.

A. Using an oxygen cylinder:

1. Place an oxygen cylinder in one of the oxygen yokes.

2. Pressurize the system by opening the cylinder valve slowly. The minimum pressure on pressure gauge should be 500 psi.

B. Using a wall source of oxygen:

1. Attach an oxygen wall source of at least 50 - 60 psi to the DISS oxygen inlet.

PROCEDURE.

1. Occlude the patient end of the aspirator tube.

2. Rotate the flow control valve to increase the vacuum. A minimum vacuum of 7.9 inches (20 cm Hg) must be attained.

5.3 TROUBLESHOOTING

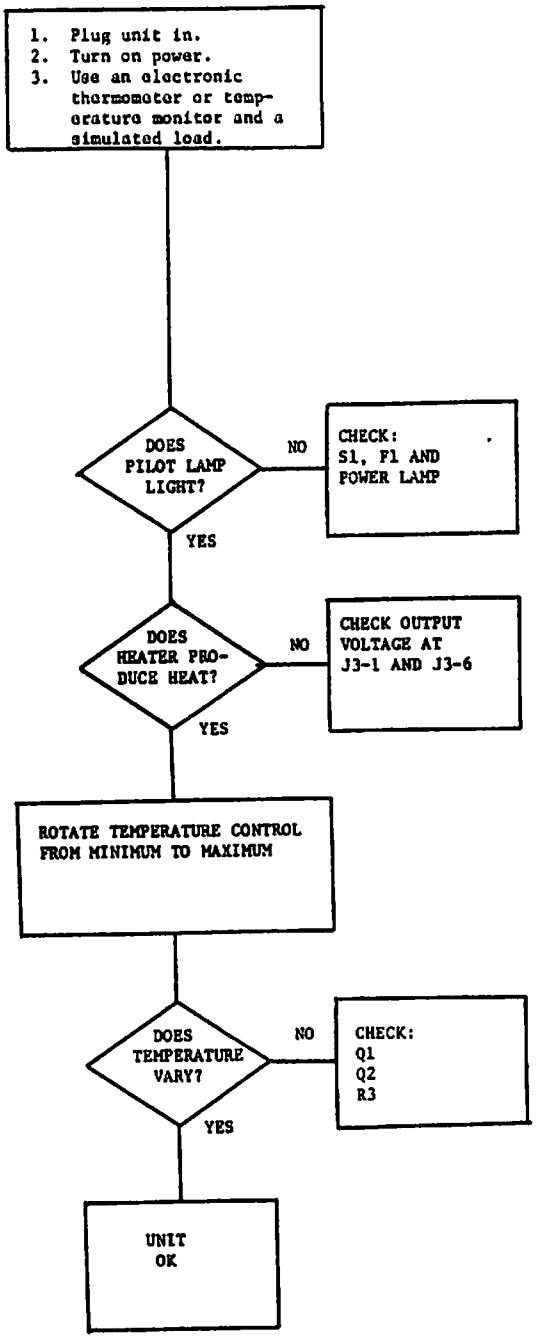
5.3.1 GENERAL

Troubleshooting information for the Air-Shields® Infant Care System and the Air-Shields® Mobile Infant Warmer Manual and Servo Controllers is presented in the flow charts on the following pages. It is assumed here that an attempt has been made to calibrate the unit. It is also assumed that the patient probe is not defective and was properly connected.

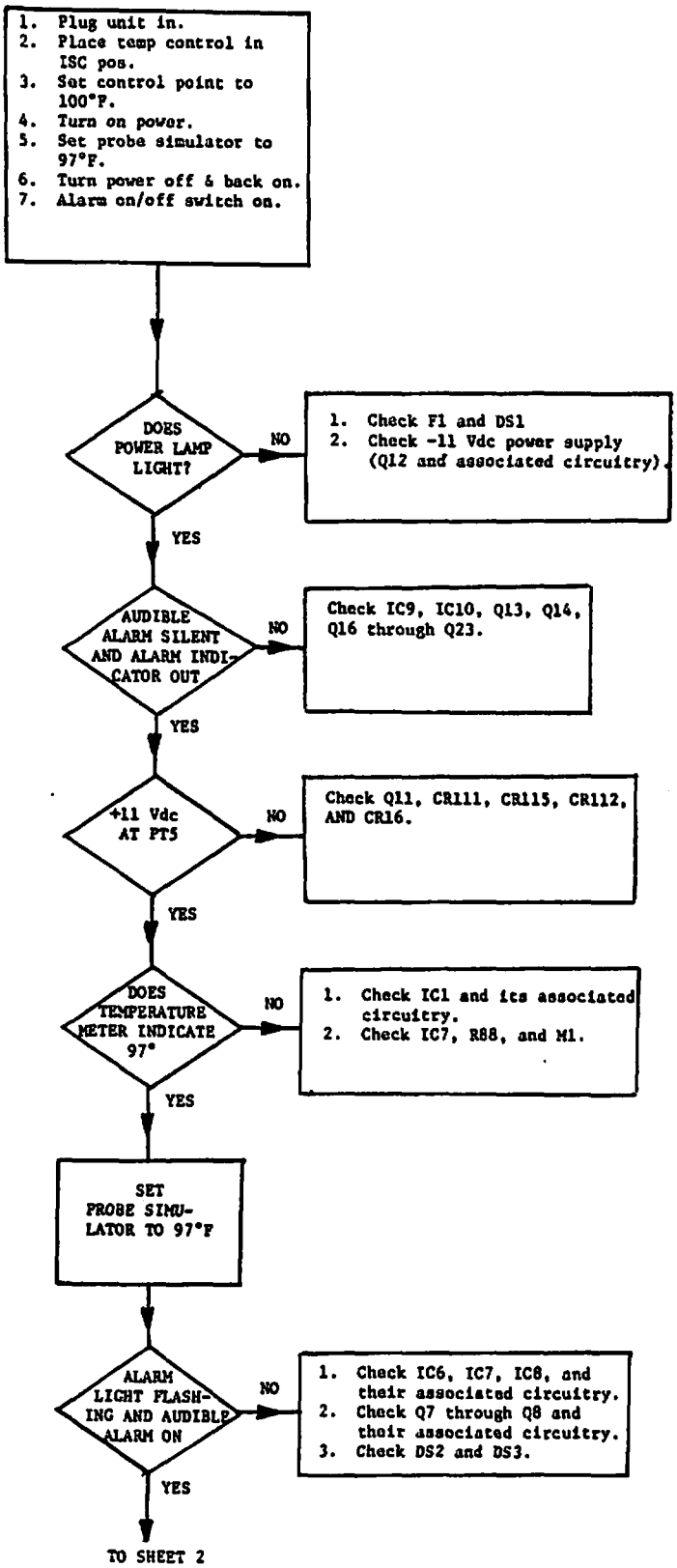
5.3.2 TEST EQUIPMENT REQUIRED

The following test equipment is required for troubleshooting. Equivalent test equipment may be substituted.

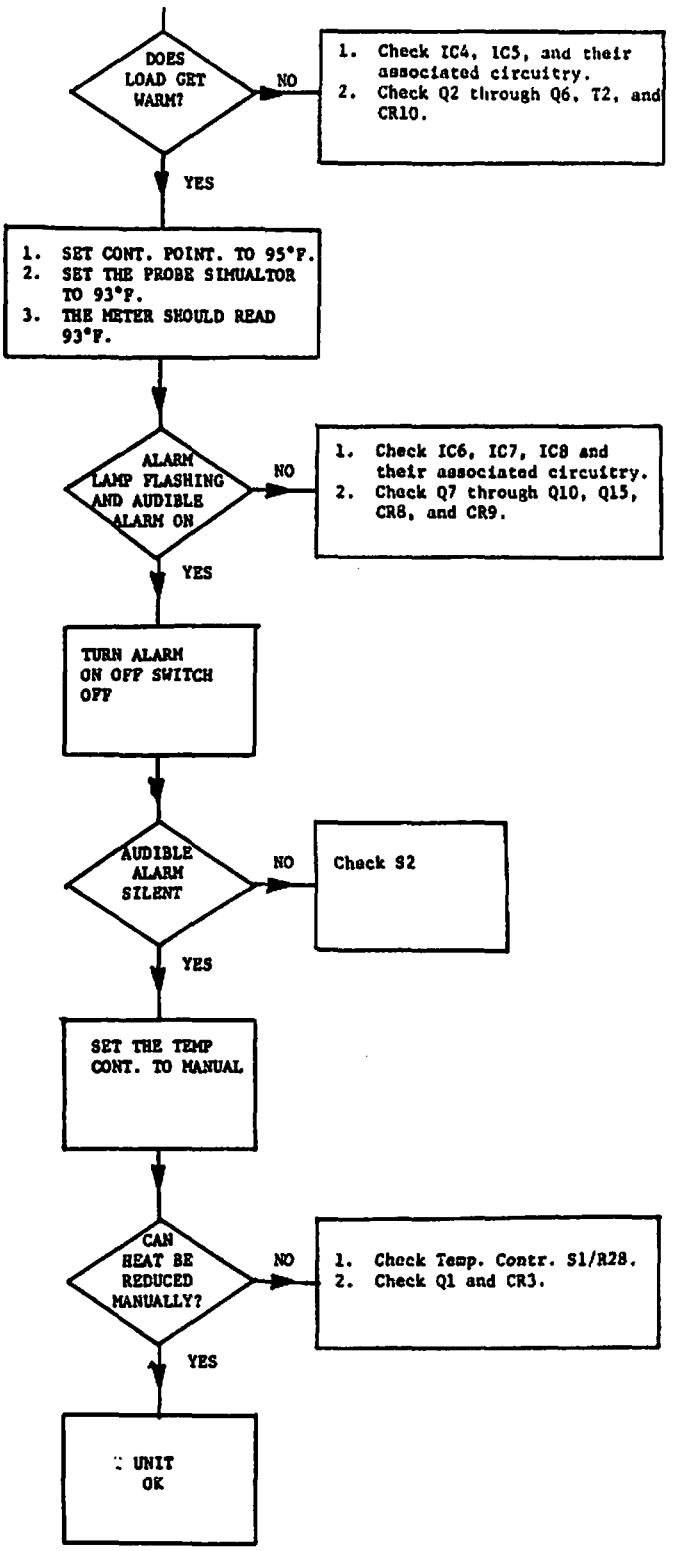
- Oscilloscope - Tektronic 561A
- Load Simulator - Heater or incandescent lamp (rated at 600 watts or less)
- Scope Probe - 10X
- Temperature Calibration Box, Part Number 26 962 71 (Probe Simulator)



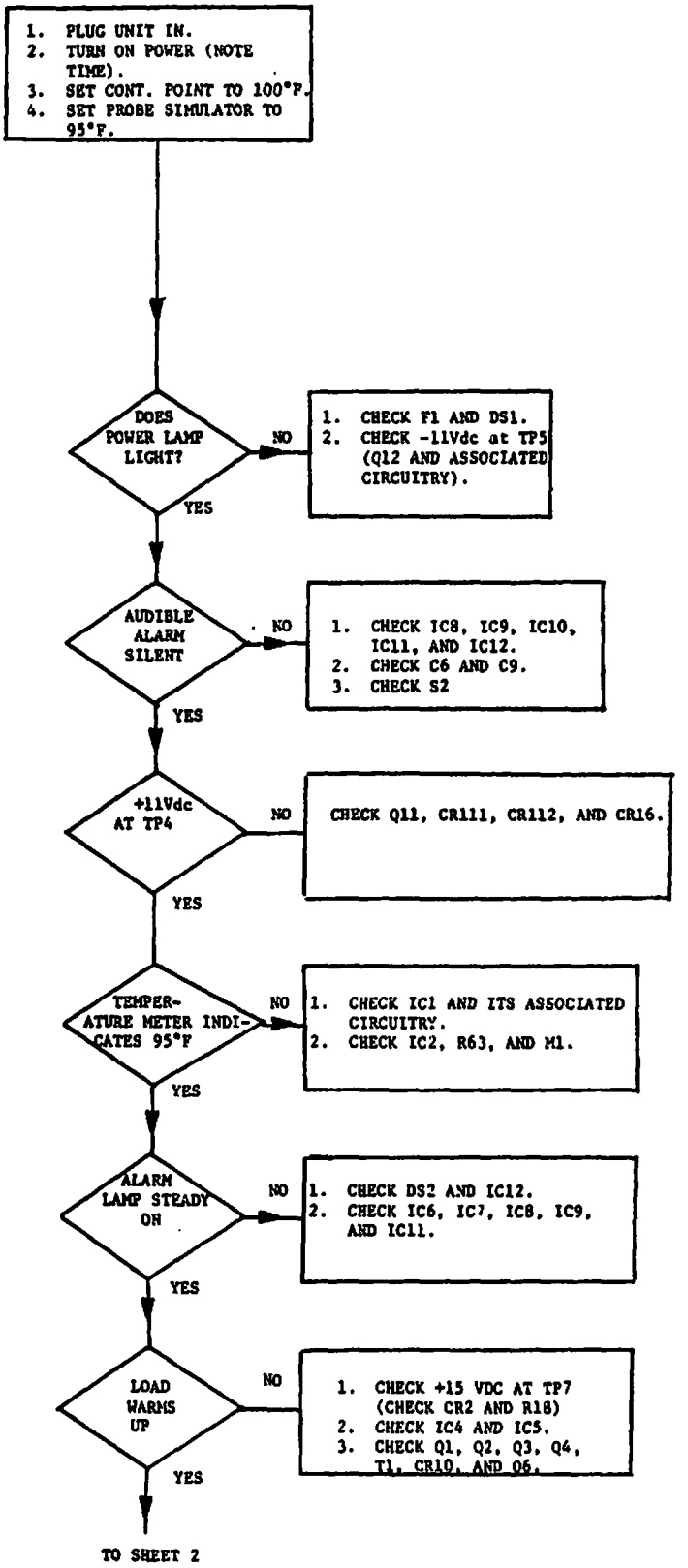
FLOWCHART 5.1 MANUAL CONTROLLER TROUBLESHOOTING


1. Plug unit in.
2. Place temp control in ISC pos.
3. Set control point to 100°F.
4. Turn on power.
5. Set probe simulator to 97°F.
6. Turn power off & back on.
7. Alarm on/off switch on.
DOES POWER LAMP LIGHT?
NO
1. Check F1 and DS1
2. Check -11 Vdc power supply (Q12 and associated circuitry)
YES
AUDIBLE ALARM SILENT AND ALARM INDICATOR OUT
NO
Check IC9, IC10, Q13, Q14, Q16 through Q23.
YES
+11 Vdc AT PT5
NO
Check Q11, CR111, CR115, CR112, AND CR16.
YES
DOES TEMPERATURE METER INDICATE 97°
NO
1. Check IC1 and its associated circuitry.
2. Check IC7, R88, and M1.
YES
SET PROBE SIMULATOR TO 97°F
ALARM LIGHT FLASHING AND AUDIBLE ALARM ON
NO
1. Check IC6, IC7, IC8, and their associated circuitry.
2. Check Q7 through Q8 and their associated circuitry.
3. Check DS2 and DS3.
YES
TO SHEET 2

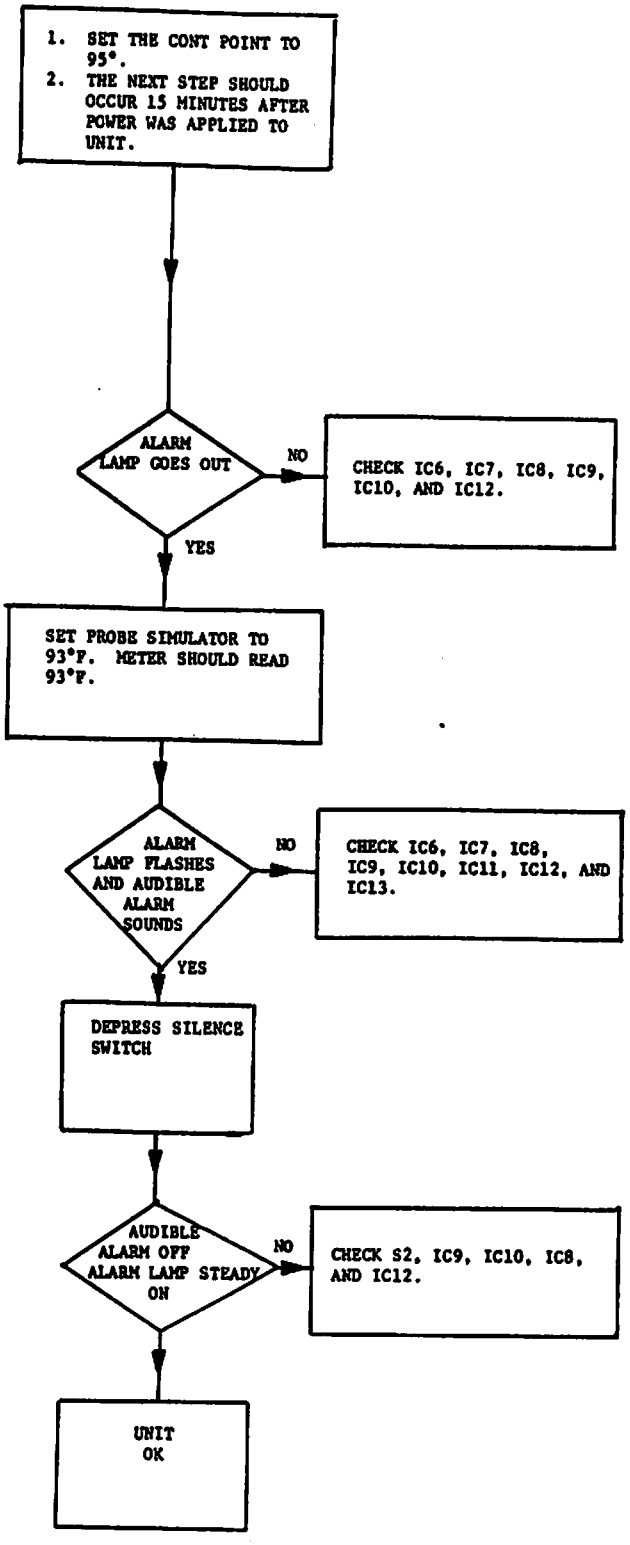
FLOWCHART 5.2 SERVO CONTROLLER (SC78-1) TROUBLESHOOTING (SHEET 1 OF 2)


DOES LOAD GET WARM?
NO
1. Check IC4, IC5, and their associated circuitry.
2. Check Q2 through Q6, T2, and CR10.
YES
1. SET CONT. POINT. TO 95°F.
2. SET THE PROBE SIMUALTOR TO 93°F.
3. THE METER SHOULD READ 93°F.
ALARM LAMP FLASHING AND AUDIBLE ALARM ON
NO
1. Check IC6, IC7, IC8 and their associated circuitry.
2. Check Q7 through Q10, Q15, CR8, and CR9.
YES
TURN ALARM ON OFF SWITCH OFF
AUDIBLE ALARM SILENT
NO
Check S2
YES
SET THE TEMP CONT. TO MANUAL
CAN HEAT BE REDUCED MANUALLY?
NO
1. Check Temp. Contr. S1/R28.
2. Check Q1 and CR3.
YES
UNIT OK

FLOWCHART 5.2 SERVO CONTROLLER (SC78-1) TROUBLESHOOTING (SHEET 2 OF 2)


1. PLUG UNIT IN.
2. TURN ON POWER (NOTE TIME).
3. SET CONT. POINT TO 100°F.
4. SET PROBE SIMULATOR TO 95°F.
DOES POWER LAMP LIGHT?
NO
1. CHECK F1 AND DS1.
2. CHECK -11Vdc at TP5 (Q12 AND ASSOCIATED CIRCUITRY).
YES
AUDIBLE ALARM SILENT
NO
1. CHECK IC8, IC9, IC10, IC11, AND IC12.
2. CHECK C6 AND C9.
3. CHECK S2
YES
+11Vdc AT TP4
NO
CHECK Q11, CR111, CR112, AND CR16.
YES
TEMPER-ATURE METER INDI-CATES 95°F
NO
1. CHECK IC1 AND ITS ASSOCIATED CIRCUITRY.
2. CHECK IC2, R63, AND M1.
YES
ALARM LAMP STEADY ON
NO
1. CHECK DS2 AND IC12.
2. CHECK IC6, IC7, IC8, IC9, AND IC11.
YES
LOAD WARMS UP
NO
1. CHECK +15 VDC AT TP7 (CHECK CR2 AND R18)
2. CHECK IC4 AND IC5.
3. CHECK Q1, Q2, Q3, Q4, T1, CR10, AND Q6.
YES
TO SHEET 2

FLOWCHART 5.3 SERVO CONTROLLER (SC78-2) TROUBLESHOOTING (SHEET 1 OF 2)


1. SET THE CONT POINT TO 95°.
2. THE NEXT STEP SHOULD OCCUR 15 MINUTES AFTER POWER WAS APPLIED TO UNIT.
ALARM LAMP GOES OUT
NO
CHECK IC6, IC7, IC8, IC9, IC10, AND IC12.
YES
SET PROBE SIMULATOR TO 93°F. METER SHOULD READ 93°F.
ALARM LAMP FLASHES AND AUDIBLE ALARM SOUNDS
NO
CHECK IC6, IC7, IC8, IC9, IC10, IC11, IC12, AND IC13.
YES
DEPRESS SILENCE SWITCH
AUDIBLE ALARM OFF ALARM LAMP STEADY ON
NO
CHECK S2, IC9, IC10, IC8, AND IC12.
UNIT OK

FLOWCHART 5.3 SERVO CONTROLLER (SC78-2) TROUBLESHOOTING (SHEET 2 OF 2)

5.4 REPAIR AND REPLACEMENT PROCEDURES

5.4.1 GENERAL

Removal and replacement instructions for components of the Infant Care System and Mobile Infant Warmer are provided below for the following components.

- Manual Controller
- Servo Controller (SC78-1 and SC78-2)
- Venturi Resuscitation/Aspiration System

Components other than those listed are obvious upon inspection.

5.4.2 CONTROLLERS

REMOVAL FROM WARMER POST

A. General - Prior to removal of a controller from the warmer post, first unplug the warmer post from the power receptacle.

B. Manual Controller - Remove the screw from the rear of the Warmer Post. The controller can be removed from the front of the Warmer Post. To replace, reverse the procedure.

C. Servo Controller (SC78-1 and SC78-2) - Remove the screw in the cover place on the rear of a controller. There is a spacer behind the cover plate. The controller can be removed from the front of the warmer post.

COVER

The cover on a Controller is removed by first removing the 4-40 screws located on the bottom. The cover is then removed by sliding the cover towards the back and in an upward direction. To replace, reverse the procedures.

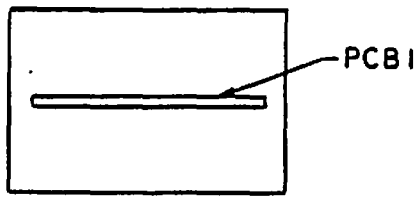
PRINTED CIRCUIT BOARDS

A. General - Printed circuit boards can be removed for replacement by first removing the cover as described above and then following the instructions below for each PCB. Refer to Figure 5.4 for PCB location and to Section 6 for hardware details.

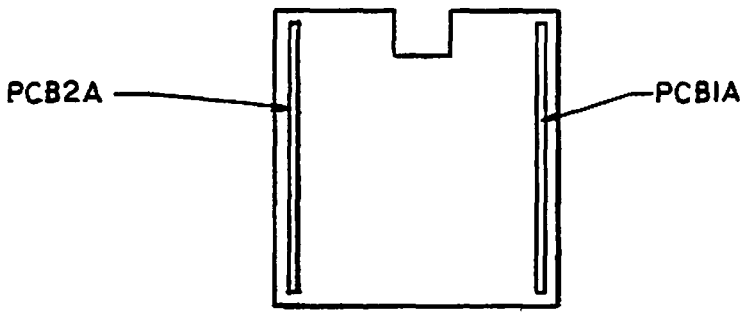
B. Manual Controller (PCB 1) - First remove the knob from the front panel. Then remove the four screws (two top, two bottom) securing the PCB to the front panel. The PCB can then be raised for servicing. If the PCB board is to be removed, the interconnecting wiring must be disconnected. To replace, reverse the procedure.

C. Servo Controller (PCB 1A and PCB 2A) - To remove a PCB, proceed as follows:

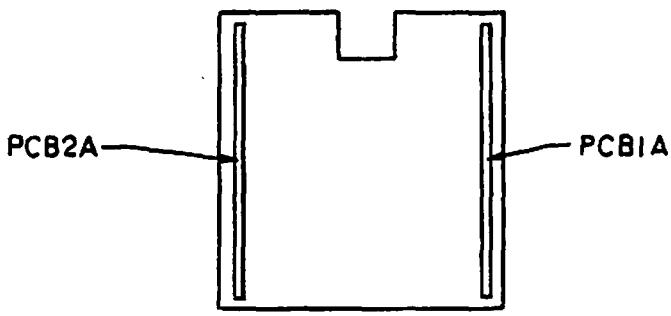
1. Remove plugs from PCB.



MANUAL CONTROLLER



SERVO CONTROLLER (SC78-1)



SERVO CONTROLLER (SC78-2)

FIGURE 5.4 PCB ASSEMBLY LOCATION DIAGRAM

2. Remove four 6-32 screws that secure the PCB to the side panel.

3. Remove the PCB by lifting straight up and out.

4. To replace, reverse the procedure.

LAMPS (SERVO CONTROLLERS ONLY)

The front panel indicator lamps can be removed for replacement by unscrewing in a counterclockwise direction. The bulb can then be removed from the lens by grasping it at the base. Replace only with a No. 345 bulb, Air-Shields Part No. 17 806 45, then screw the lens and bulb assembly back into the front panel.

5.4.3 VENTURI RESUSCITATION/ASPIRATION SYSTEM

The following repair and replacement procedures apply to the venturi resuscitation/ aspiration system:

MICRO-FILTER VENTURI

The micro-filter and venturi requires replacement or cleaning if at least 200 mm Hg of vacuum are not attainable when using the venturi resuscitation/ aspiration package. Proceed as follows:

1. Move the Warmer Module Post to the tilt position.

2. Remove six (6) Philips screws and the Back Accessory Panel Cover.

3. Remove Micro-Filter assembly by unscrewing counterclockwise (Figure 5.5).

4. Remove Venturi Housing Collar.

5. Pull Venturi out of housing (Figure 5.6).

6. Replace Venturi, Venturi Housing Collar, and Micro-Filter assembly.

7. Reassemble Back Accessory Panel.

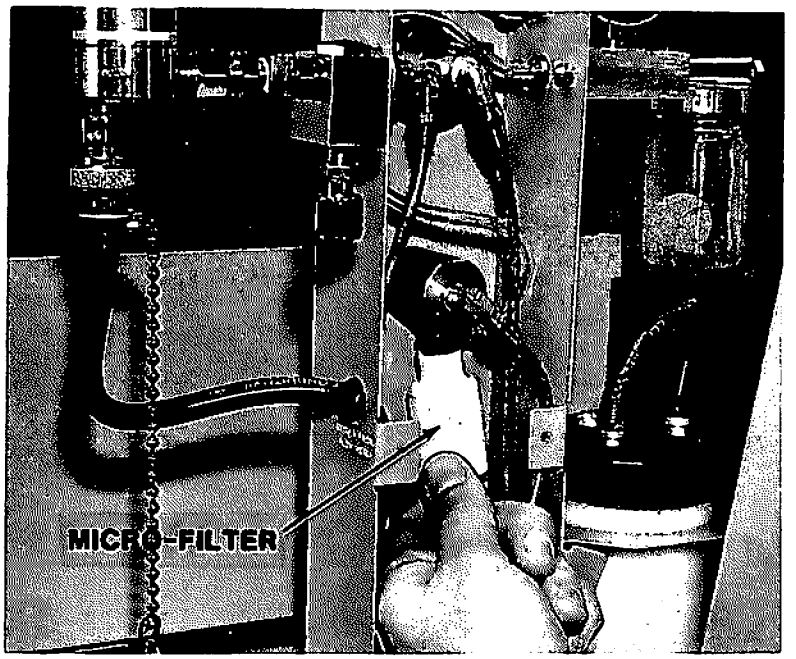


FIGURE 5.5 MICRO-FILTER REMOVAL

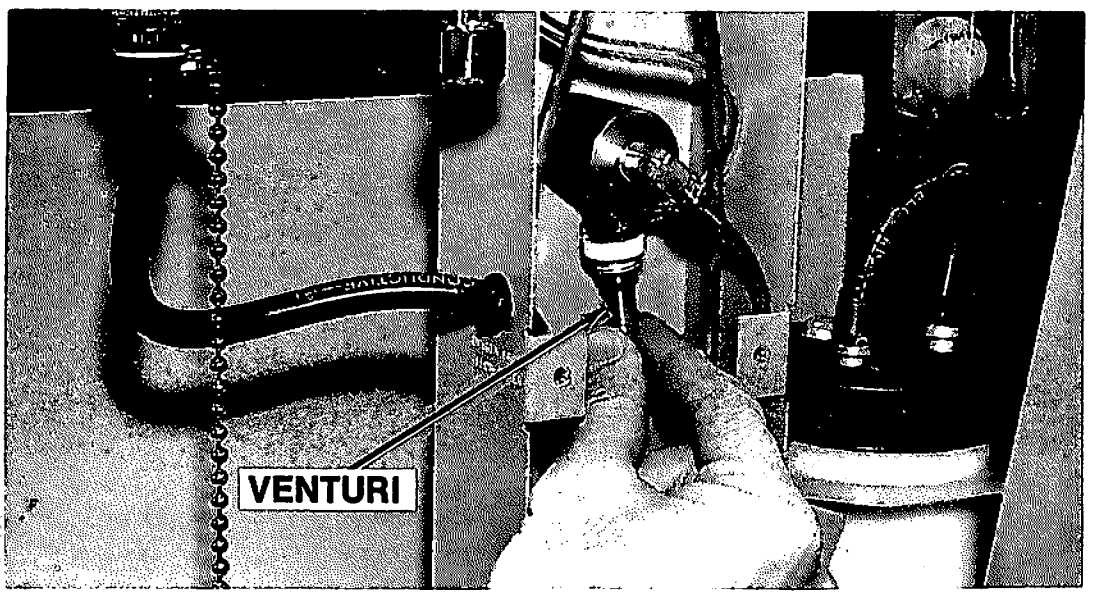


FIGURE 5.6 VENTURI REMOVAL

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SECTION 6
PARTS LIST

6.1 GENERAL

This section provides parts lists for the Air-Shields® Infant Care System and the Air-Shields® Mobile Infant Warmer. Figure 6.1 is a composite of all possible components. Table 6.1 is a listing of those components and part numbers.

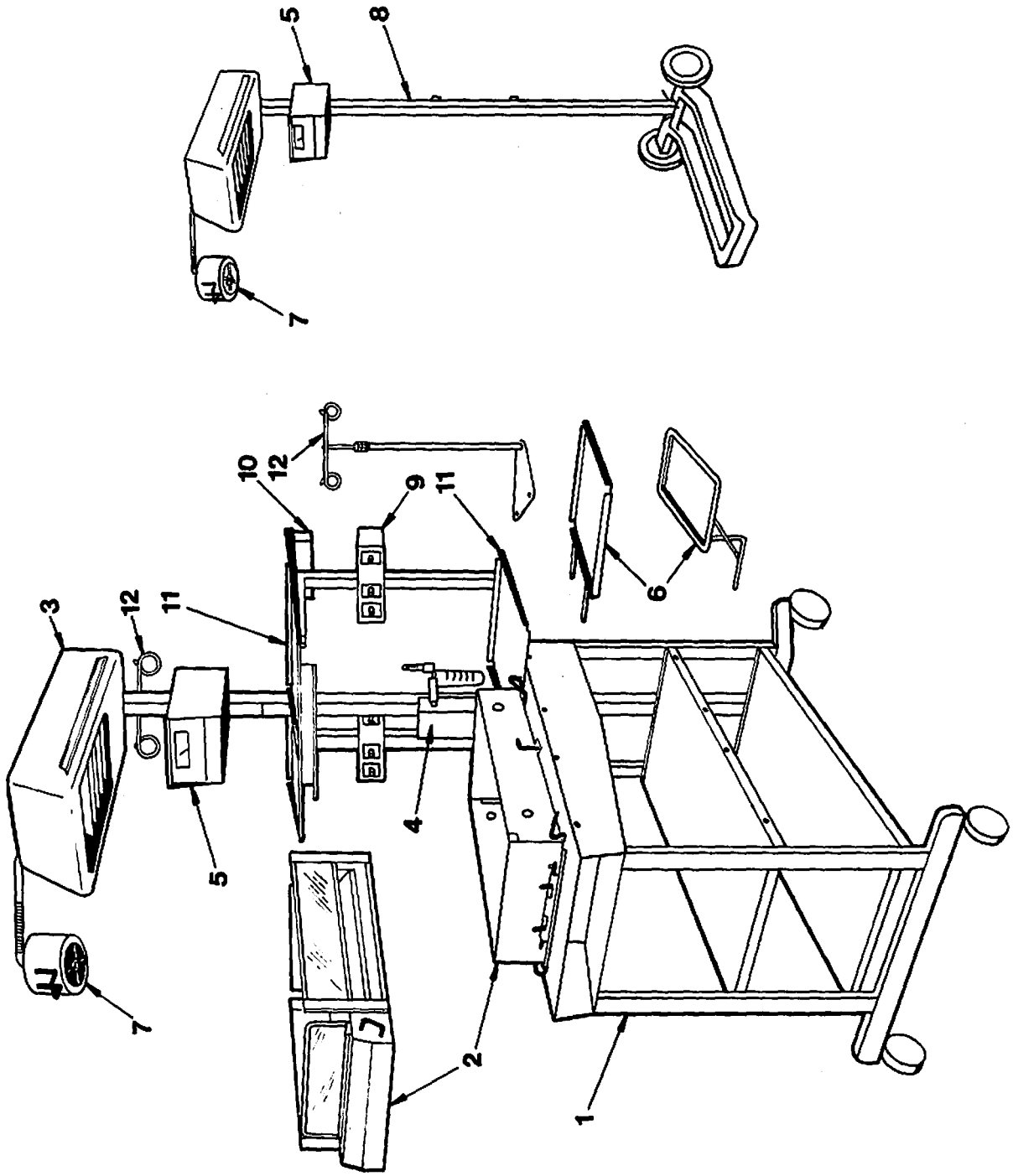

FIGURE 6.1 INFANT CARE SYSTEM AND MOBILE INFANT WARMER EQUIPMENT COVERED IN THIS SECTION

TABLE 6.1 INFANT CARE SYSTEM AND MOBILE INFANT WARMER EQUIPMENT COVERED IN THIS SECTION (SHEET 1 OF 2)

ITEM NO.	DESCRIPTION	PART NO.	PARTS LIST TABLE NO.
Fig. 6.1			
1	SPECIAL PROCEDURES CARTS		
	STANDARD CART ASSEMBLY	78 100 95	6.10
	INTENSIVE CARE CART ASSEMBLY	78 100 90	6.11
	INTENSIVE CARE BASIC WELD	78 112 01	6.12
2	BASSINETS		
	STANDARD BASSINET	78 702 76	6.10
	INTENSIVE CARE BASSINET	78 140 70	6.15
	INTENSIVE CARE BASSINET	78 140 71	6.16
3	WARMER MODULES		
	WARMER MODULE WITH EXAMINATION LIGHT	78 200 70, 75	6.14
	WARMER MODULE WITHOUT EXAMINATION LIGHT	78 200 80, 85	6.14
4	OXYGEN DELIVERY SYSTEMS		
	RESUSCITATION/ASPIRATION ASSEMBLY	78 400 70	6.17
	VENTURI RESUSCITATION/ASPIRATION ASSEMBLY	78 405 70	6.18
	OXYGEN DELIVERY SYSTEM WITH TANK PROVISION	78 400 81/82	6.19
	OXYGEN DELIVERY SYSTEM WITHOUT TANK PROVISION	78 400 80	6.20
5	CONTROLLERS		
	MANUAL CONTROLLER	78 350 70/75	6.2, 6.3
	SERVO CONTROLLER (SC78-1)	78 300 74-79	6.4, 6.5, 6.6
	SERVO CONTROLLER (SC78-2)	78 300 80-85	6.7, 6.8, 6.9
6	INSTRUMENT TRAYS		
	STANDARD BASSINET	78 105 70	6.28
	INTENSIVE CARE BASSINET	78 105 80	6.29

TABLE 6.1 INFANT CARE SYSTEM AND MOBILE INFANT WARMER EQUIPMENT COVERED IN THIS SECTION (SHEET 2 OF 2)

ITEM NO.	DESCRIPTION	PART NO.	PARTS LIST TABLE NO.
7	EXAMINATION LIGHTS		
	EXAMINATION LIGHT (FLEXIBLE EXTENTION)	78 240 70	6.21
	EXAMINATION LIGHT (RIGID EXTENTION)	78 240 70	6.22
8	MOBILE INFANT WARMER	78 600 71/72	6.13
9	GAS DELIVERY PANELS		
	ONE PIECE HOSE ASSEMBLIES	78 430 70-73	6.25
	TWO PIECE HOSE ASSEMBLIES	78 430 70-73	6.26
10/11	SHELVES (STANDARD AND INTENSIVE CARE CARTS)		
	SINGLE TIER ASSEMBLY	78 115 70/75	6.23
	DOUBLE TIER ASSEMBLY	78 125 70/75	6.23
	SHELVES (BASIC WELD CART)		
	SINGLE TIER ASSEMBLY	78 914 80	6.24
	DOUBLE TIER ASSEMBLY	78 914 81	6.24
12	IV POLE		
	SINGLE TIER SHELF	78 109 70	6.30
	DOUBLE TIER SHELF	78 109 71	6.30
	TREE ASSEMBLY	78 906 70	6.30
13	AC RECEPTACLE BOX (120 VAC) NOT SHOWN	78 910 70	6.27

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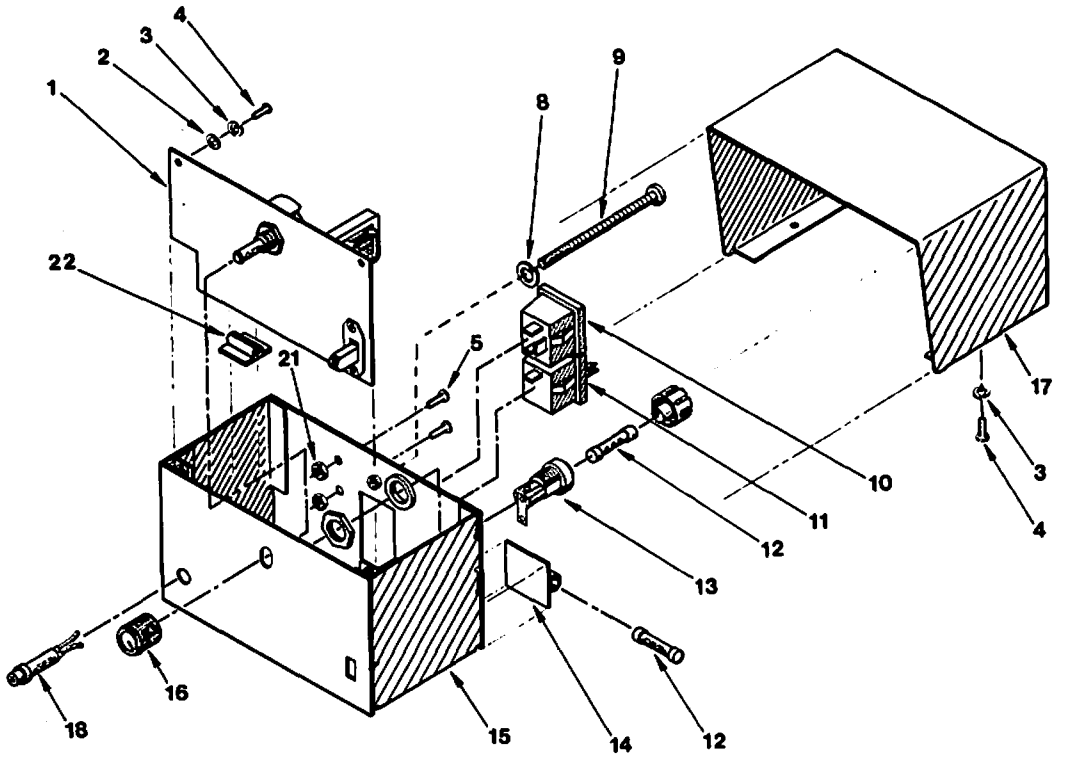

FIGURE 6.2 MANUAL CONTROLLER, PARTS LOCATION DIAGRAM

TABLE 6.2 MANUAL CONTROLLER, PARTS LIST

PART NO. 78 350 70 (100-120 V 50/60 HZ)
PART NO. 78 350 75 (220-240 V 50 HZ)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.2				
1	PCB 1	PCB NO. 1 ASSEMBLY (100-110-120V)	78 360 70	1
		PCB NO. 1 ASSEMBLY (220V)	78 360 75	1
2		WASHER, NO. 4, FL, SS	99 121 21	2
3		WASHER, NO. 4 LK, SS	99 121 35	4
4		SCREW, NO. 4-40 x 1/4, TR, PH, SS	99 010 56	4
5		SCREW, NO. 6-32 x 1/4, TR, PH, SS	99 022 72	2
6		NOT USED		
7		NOT USED		
8		WASHER, NO. 10, LK, SHI, SS	99 123 92	1
9		SCREW, NO. 10-32 x 2-1/4, TR, PH, SS	99 045 25	1
10	P1	SOCKET, AC	17 722 37	1
11	P2	PLUG, AC	17 722 46	1
12	F1	FUSE, 8 AMP, QUICK ACTING (100-110-120V)	17 726 48	2
		FUSE, 5 AMP, QUICK ACTING (220V/240V)	17 718 60	2
13		FUSE HOLDER	17 700 31	1
14	XF1	FUSE HOLDER, SPARE	77 000 65	1
15		CHASSIS, MARKED (100-110-120V)	78 350 26	1
		CHASSIS, MARKED (220V)	78 350 25	1
16		KNOB	17 060 70	1
17		COVER	78 350 15	1
18	DS1	PILOT LIGHT	17 806 54	1
19		NOT USED		
20		NOT USED		
21		NUT, NO. 6-32, HX, KEPS, S CAD	99 105 34	2
22		PCB GUIDE	17 060 71	1

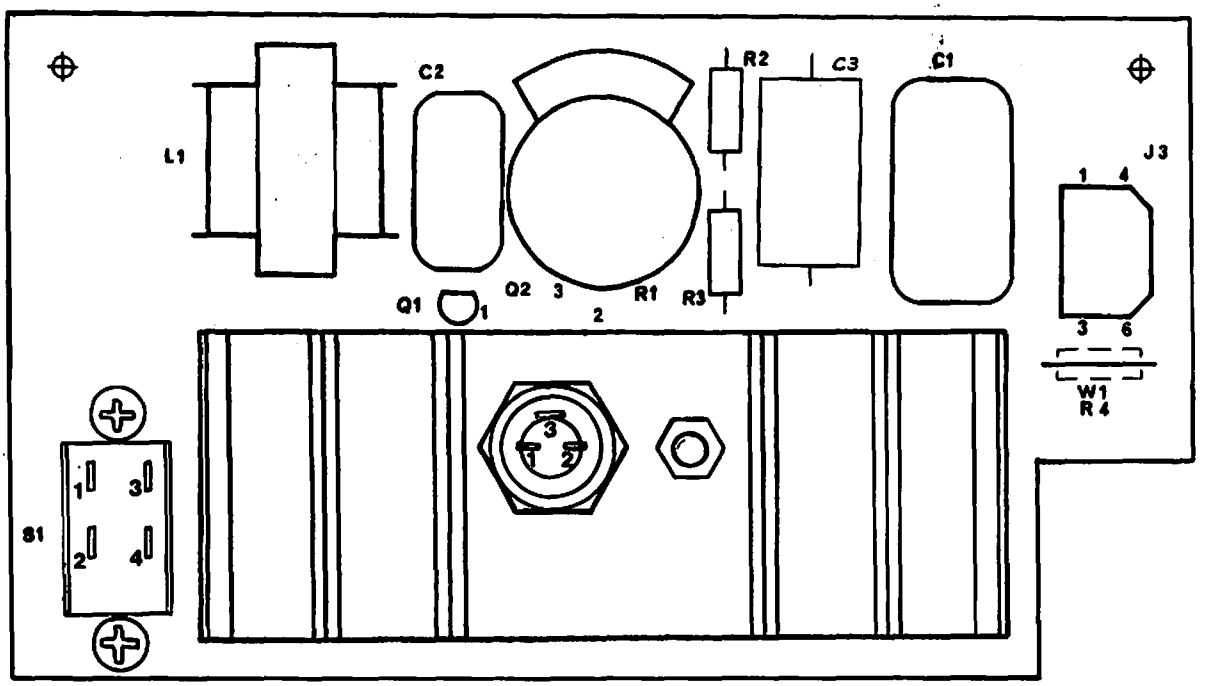

FIGURE 6.3 PCB 1, FOR MANUAL CONTROLLER, PARTS LOCATION DIAGRAM

TABLE 6.3 PCB 1, FOR MANUAL CONTROLLER, PARTS LIST

PART NO. 78 360 70 (100-120 V 50/60 HZ)
Part No. 78 360 75 (220-240 V 50 HZ)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.3				
1		NOT USED		
2		HEAT SINK	78 310 10	1
3		SCREW, NO. 4-40 x 5/8, TR, SL, SS	99 011 95	1
4		NUT, NO. 4-40, HEX, KEPS, S, CAD	99 103 33	3
5		WASHER, FL, SS	99 121 21	1
6		SCREW, NO. 4-40 x 1/4, TR, PH, SS	99 010 45	2
7	C1	CAPACITOR, 0.15 UF, 250V	17 420 06	1
8	C3	CAPACITOR, 0.1 UF, 630V	17 410 31	1
9	C2	CAPACITOR, .022 UF, 200V	17 410 19	1
10		NOT USED		
11	L1	CHOKE. 120 UH	17 585 13	1
12		NOT USED		
13	Q1	DIAC, MPT-20	17 550 61	1
14		COMPOUND, DOW CORNING	99 901 29	AR
15	R1	POTENTIOMETER, 150K (100-110-120V)	17 529 67	1
		POTENTIOMETER, 300K (220V)	17 529 71	1
16	R2	RESISTOR, 10K, 1/4W, 5%	17 211 23	1
17	R3	RESISTOR, 4.7K, 1/2W, 5%	17 204 40	1
18	S1	SWITCH, DPST	17 681 62	1
19	Q2	TRIAC, 2N6164 (100-110-120V)	17 550 64	1
		TRIAC, 2N6165 (220V)	17 550 65	1
20	W1	WIRE, BUS, 22 AWG (100-110-120V)	17 715 50	AR
21	R4	RESISTOR, 100K, 1/2W, 4$ (220V)	17 207 60	1
22		WIRE, 20 AWG, WHT	17 709 09	AR
23		NUT, 1/4-28 HX, SS, JM	17 109 81	1
24		WIRE, 18 AWG, WHT	17 717 29	AR
25	J3	CONNECTOR, 6 TERM.	17 724 67	1
26		WIRE, 20 AWG, BLK	17 709 00	AR

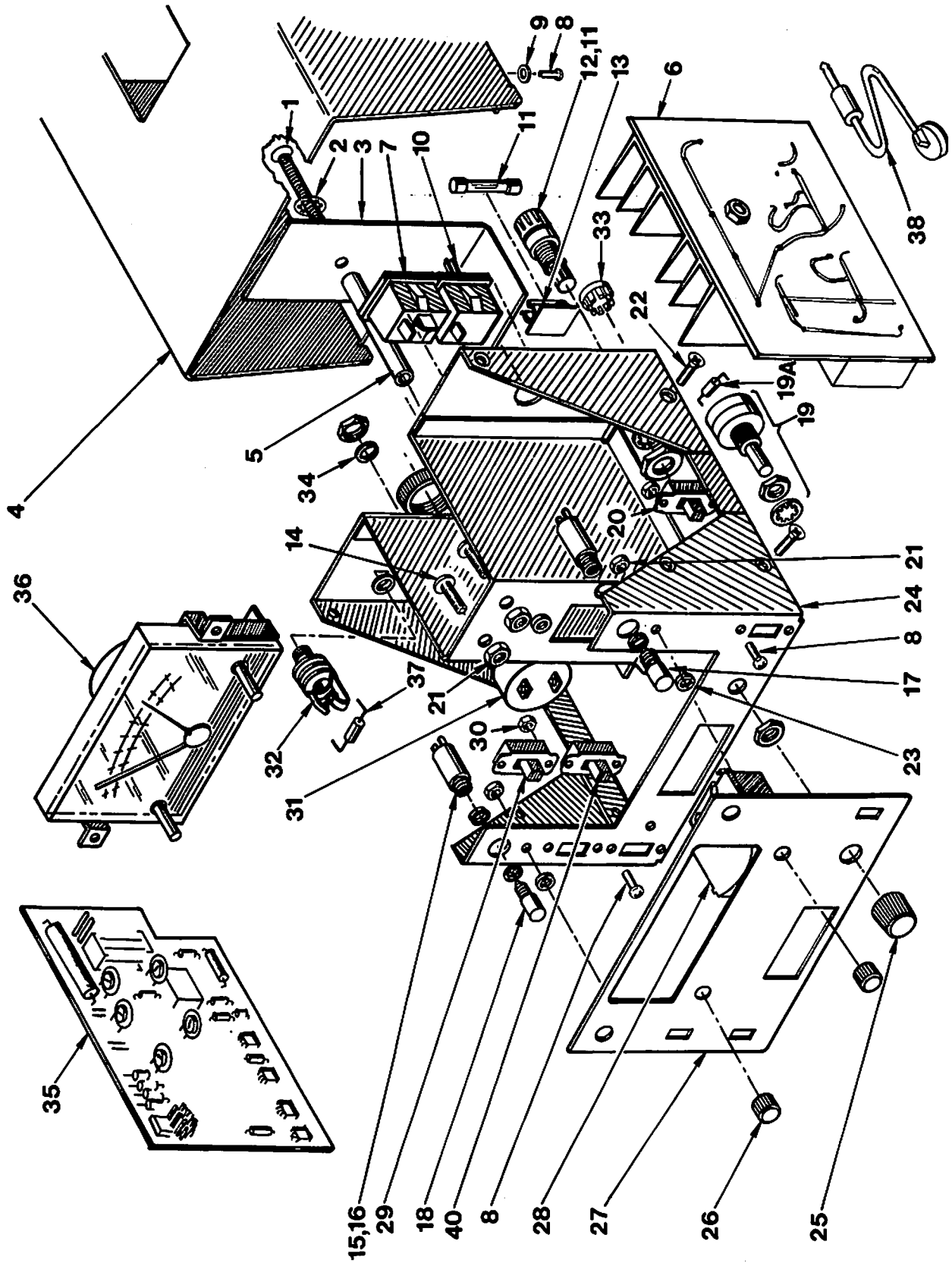

FIGURE 6.4 SERVO CONTROLLER MODEL SC78-1, PARTS LOCATION DIAGRAM

TABLE 6.4 SERVO CONTROLLER MODEL SC78-1, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 300 74 (220-240V 60 Hz)
PART NO. 78 300 75 (110-120V 60 Hz)
PART NO. 78 300 76 (110-120V 50 Hz)
PART NO. 78 300 77 (220-240V 50 Hz)
PART NO. 78 300 78 (100V 50 Hz)
PART NO. 78 300 79 (100V 60 Hz)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.4				
1		SCREW, NO. 10-32 x 4, LG, RD, SL, S, CA	99 046 40	1
2		WASHER, NO. 10, LK, SHI, SS	99 123 92	1
3		COVER PLATE	78 300 50	1
4		COVER	78 300 20	1
5		SPACER	78 300 56	1
6	PCB 1A	PCB NO. 1A ASSEMBLY (110-120V)	78 310 71	1
		PCB NO. 1A ASSEMBLY (220-240V)	78 310 76	1
		PCB NO. 1A ASSEMBLY (100V)	78 310 77	1
7	P3	SOCKET, AC	17 722 37	1
8		SCREW, NO. 4-40 x 1/4, TR, PH, SS	99 010 56	10
9		WASHER, NO. 4, LK, SHI, SS	99 121 35	4
10	P2	PLUG, AC	17 722 46	1
11	F1	FUSE, 8 AMP, QUICK ACTING (100/115V)	17 726 48	2
		FUSE, 5 AMP, QUICK ACTING (220V-240V)	17 718 60	2
12	XF1	FUSE HOLDER	17 700 31	1
13		FUSE HOLDER, SPARE	77 000 65	1
14		SCREW, NO. 6-32 x 3/8, TR, PH, SS	99 023 31	2
15	XDS1, XDS2	SOCKET, BULB	17 724 32	2
16	DS1, DS2	BULB, NO. 345	17 806 45	2
17		CAP, LENS, WHITE	17 806 44	1
18		CAP, LENS, RED	17 806 46	1
19*	R28	POT, SWITCH, 50K	17 529 82	1
19A	R102	RESISTOR, 100K 1/4 W 5%	17 215 14	1
20	S1	SWITCH, SLIDE, DPST	17 681 61	1
21		NUT, NO. 6-32, HX, KEPS, S, CA	99 105 34	5
22		SCREW, NO. 6-32 x 1/4, FL, PH, SS, (100°)	99 022 77	8
23		WASHER, NYLON	99 122 50	3
24		CHASSIS, MARKED (100-120V 60 Hz)	78 300 41	1
		CHASSIS, MARKED (110-120V 50 Hz)	78 300 42	1
		CHASSIS, MARKED (220-240V 50 Hz)	78 300 40	1
		CHASSIS, MARKED (100V 50 Hz)	78 300 43	1
		CHASSIS, MARKED (100V 60 Hz)	78 300 44	1
		CHASSIS, MARKED (220-240V 60 Hz)	78 300 39	1

*This part is a replacement for Part No. 17 529 68, which was 25K, however, item 19A is also required and must be soldered between terminals 2 and 3 of R28. Additionally, a jumper wire must be installed between terminals 1 and 2.

TABLE 6.4 SERVO CONTROLLER MODEL SC78-1, PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
25		KNOB	17 060 62	1
26		KNOB	17 060 60	2
27		PANEL, FRONT, MARKED	78 300 65	1
28	M2	METER (110V-120V 50/60 Hz)	17 776 59	1
		METER (220-240V 50/60 Hz)	17 776 60	1
		METER (100V 50/60 Hz)	17 777 10	1
29	S3	SWITCH, SLIDE, DPDT	17 681 25	1
30		NUT, NO. 4-40, HX, KEPS, S, CA	99 103 33	8
31	DS3	SONALERT	17 652 21	1
32	J4	JACK	17 712 30	1
33		PLUG, BUTTON	22 059 60	1
34		WASHER, FIBER	17 803 40	2
35	PCB 2A	PCB NO. 2A ASSEMBLY (110-120V 60 Hz)	78 311 71	1
		PCB NO. 2A ASSEMBLY (100-110-120V 50 Hz & 220-240V)	78 311 76	1
36	M1, R20, R14	METER ASSEMBLY	78 301 70	1
37	R87	RESISTOR, 1430 OHM, 1/4 W, 1%	17 216 11	1
38		PROBE, TEMP SENSING	17 575 14	1
39		NOT USED		
40	S2	SWITCH, SLIDE, SPST	17 681 33	1
41*	P6, P7	CONNECTOR HOUSING, 6 TERM	17 725 32	2
		TERMINAL, FEMALE	17 725 36	10
		TERMINAL, MALE	17 725 35	2
42*	P5, P9	CONNECTOR HOUSING 9 TERM	17 725 33	2
		TERMINAL, FEMALE	17 725 36	16
		TERMINAL, MALE	17 725 35	2
43*	P8	CONNECTOR HOUSING, 12 TERM	17 725 34	1
		TERMINAL, FEMALE	17 725 36	11
		TERMINAL, MALE	17 725 35	
44*		CONNECTOR HOUSING, 3 TERM	17 725 31	1
		TERMINAL, FEMALE	17 725 36	2
		TERMINAL, MALE	17 725 35	1
		*CABLE ASSEMBLIES NOT SHOWN.		

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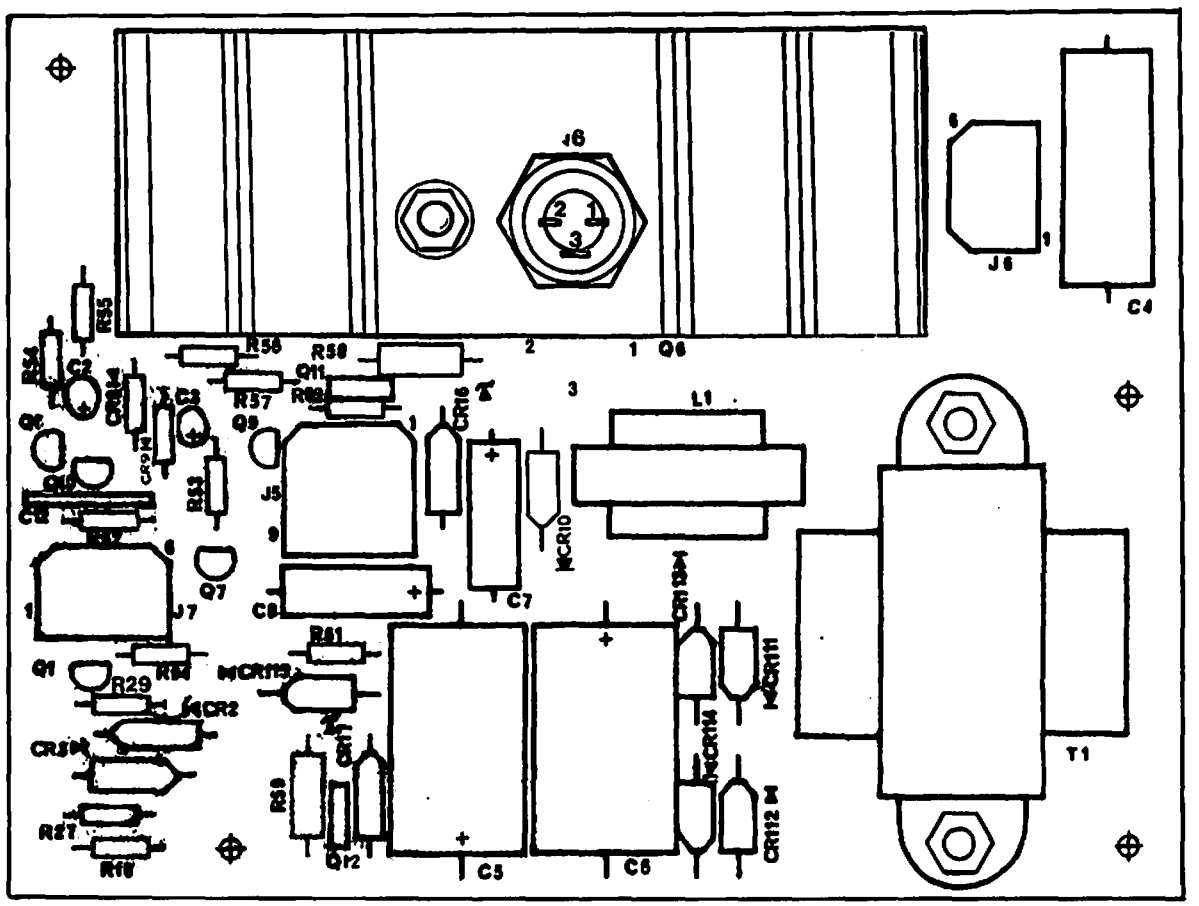

FIGURE 6.5 PCB 1A, SERVO CONTROLLER (SC78-1), PARTS LOCATION DIAGRAM

TABLE 6.5 PCB 1A,
SERVO CONTROLLER (SC78-1), PARTS LIST (SHEET 1 OF 2)

PART NO. 78 310 71 (110-120 V 50/60 HZ)
PART NO. 78 310 76 (220-240 V 50/60 HZ)
PART NO. 78 310 77 (100 V 50/60 HZ)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.5				
1		NOT USED		
2		NOT USED		
3		HEAT SINK, IERC E3 SERIES	78 310 10	1
4		SCREW, NO. 4-40 x 5/8, TR, SL, SS	99 011 94	1
5		NUT, NO. 4-40, HX, KEPS, S, CAD	99 103 33	1
6		WASHER, FL, SS	99 121 20	1
7		SCREW, NO. 8-32, x 5/16, TR, PH, SS	99 031 05	2
8		NUT, NO. 8-32 , HX, KEPS, S, CAD	99 106 32	2
9		NUT, 1/4-28, HX, SS, JM	99 109 81	1
10	C5, C6	CAPACITOR, 680 UF, 25V	17 405 06	2
11	C7, C8	CAPACITOR, 25 UF, 25V	17 405 28	2
12	C4	CAPACITOR, 0.1 UF, 630V	17 410 31	1
13	C2, C3	CAPACITOR, 10 UF, 20V	17 405 25	2
14	C12	CAPACITOR, 0.1 UF, 25V	17 430 42	1
15		NOT USED		
16	L1	CHOKE, 120 UH	17 585 13	1
17		NOT USED		
18	J6, J7	CONNECTOR, 6 PIN	17 724 67	2
19	J5	CONNECTOR, 9 PIN	17 724 68	1
20		NOT USED		
21	CR111, 112, 113, 114, 115, CR10	DIODE, 1N2483	17 502 05	6
22	CR8, CR9	DIODE, 1N914A	17 502 06	2
23	CR16, 17	DIODE, ZENER, 1N4742A	17 502 21	2
24	CR2	DIODE, ZENER, 1N4744A	17 502 38	1
25	CR3	DIODE, ZENER, 1N4733A	17 502 20	1
26		NOT USED		
27	R58, R59	RESISTOR, 390 OHM, 1/2 W, 5%	17 211 49	2
28	R83, R18, R61	RESISTOR, 200 OHM, 1/4 W, 5%	17 216 01	3
29	R53	RESISTOR, 4.7K, 1/4 W, 5%	17 215 00	1
30	R27, 28, 94	RESISTOR, 2K, 1/4 W, 5%	17 215 08	3
31	R54	RESISTOR, 10K, 1/4 W, 5%	17 214 60	1
32	R55, 56, 62	RESISTOR, 47K, 1/4 W, 5%	17 215 02	3
33	R57	RESISTOR, 3K, 1/4 W, 5%	17 216 02	1
34		COMPOUND, DOW CORNING	99 901 29	AR
35	T1	TRANSFORMER, POWER (110-120V)	17 604 18	1
		TRANSFORMER, POWER (220-240V)	17 604 24	1
		TRANSFORMER, POWER (100V)	17 604 32	1
36	Q11	TRANSISTOR, 2N4921	17 627 10	1
37	Q12	TRANSISTOR, 2N4918	17 627 11	1
38	Q1	TRANSISTOR, 2N4126	17 625 57	1

TABLE 6.5 PCB 1A,

SERVO CONTROLLER (SC78-1), PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
39	Q7, 8, 9, 10	Transistor, 2N4124	17 625 58	4
40	Q6	TRIAC, 2N6164 (100-110-120V)	17 550 64	1
41		TRIAC, 2N6165 (220-240V)	17 550 65	1
42		WIRE, 18 AWG, WHT	17 717 29	AR
53		SLEEVING, INSUL.	17 020 55	AR

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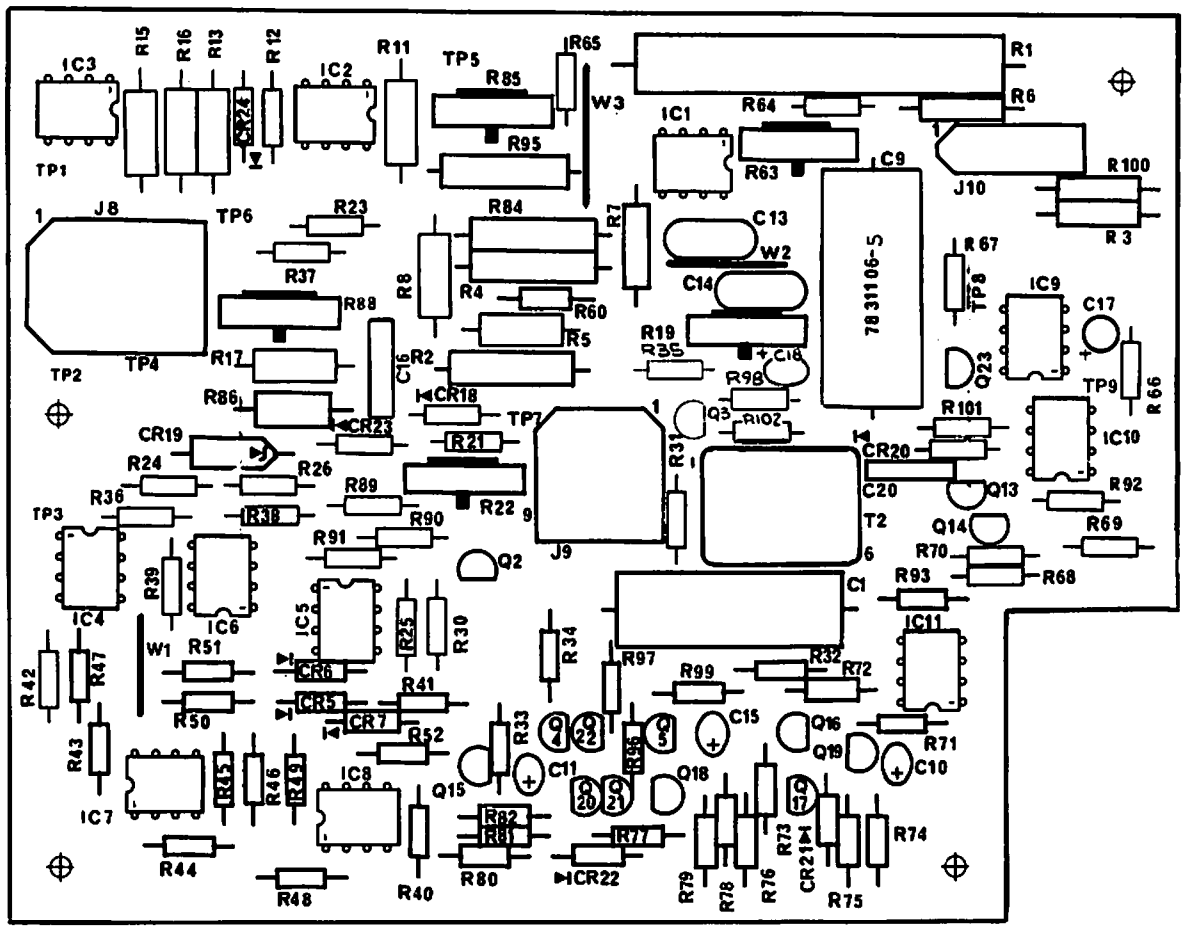

FIGURE 6.6 PCB 2A, SERVO CONTROLLER (SC78-1), PARTS LOCATION DIAGRAM

TABLE 6.6 PCB 2A
SERVO CONTROLLER (SC78-1), PARTS LIST (SHEET 1 OF 2)

PART NO. 78 311 71 (110-120 V, 220-240 V 60 HZ)
PART NO. 78 311 76 (100 V, 110-120 V, 220-240 V 50 HZ)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.6				
1		NOT USED		
2		NOT USED		
3		NOT USED		
4	C1	CAPACITOR 0.22 UF, 100V	17 420 08	1
5	C10, C11, C15, C17	CAPACITOR, 10 UF, 20V	17 405 25	4
6	C9	CAPACITOR, 1.5 UF, 50V	17 420 12	1
7	C13, C14	CAPACITOR, 470 PF	17 430 46	2
8	J8	CONNECTOR, 12 PIN	17 724 69	1
9	J9	CONNECTOR, 9 PIN	17 724 68	1
10	J10	CONNECTOR, 3 PIN	17 725 66	1
11	CR5, CR6, CR7, CR18, CR21, CR22, CR23	DIODE, 1N914A	17 502 06	7
12	CR20, CR24	DIODE, 1N485B	17 502 15	2
13	CR19	DIODE, ZENER, 6.2V, 1N4735A	17 502 22	1
14	C20	CAPACITOR, 0.47 UF, 25V	17 430 03	1
15	IC1, IC2, IC3, IC4, IC5, IC6, IC7, IC8, IC9, IC10, IC11	INT. CKT. T.I. 727411C-P	17 629 07	11
16	R70	RESISTOR, 300 OHM, 5%, 1/4W	17 216 15	1
17	R86	RESISTOR, 1193 OHM, 0.1%	17 212 50	1
18	R2	RESISTOR, 10K, 5%, 3.75 W	17 214 49	1
19	R84	RESISTOR, 680 OHMS 5%, 3/75W	17 216 03	1
20		NOT USED		
21	R5, R6	RESISTOR, 100K, 1%, 1/4 W	17 215 24	2
22	R7, R8	RESISTOR, 499K, 1%, 1/4 W	17 216 04	2
23	R31, R32, R33, R41, R68, R69, R71, R101, R102	RESISTOR, 10K, 5%, 1/4 W	17 214 60	9
24	R23, R24	RESISTOR, 20K, 5%, 1/4 W	17 216 05	2
25	R11, R16, R4	RESISTOR, 1K, 1%, 1/4 W	17 215 19	3
26	R12, R49	RESISTOR, 1K, 5%, 1/4 W	17 215 04	2
27	R13	RESISTOR, 30.1K, 1%, 1/8 W	17 214 51	1
28	R15, R17,	RESISTOR, 3.83K, 1%, 1/4 W	17 206 50	2

TABLE 6.6 PCB 2A
SERVO CONTROLLER (SC78-1), PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
29	R25, R26, R36, R37, R38, R39, R64, R66, R73, R74, R77, R78, R80, R81	RESISTOR, 100K, 5%, 1/4 W	17 215 14	14
30	R35	RESISTOR, 820 OHM, 5%, 1/4 W	17 215 36	1
31	R30	RESISTOR, 3K, 5%, 1/4 W (100-110-120V)	17 216 02	1
		RESISTOR, 3.6K, 5%, 1/4 W (220-240V)	17 216 10	1
32	R46	RESISTOR, 470 OHM, 5%, 1/4 W	17 214 59	1
33	R60	RESISTOR, 150 OHM, 5%, 1/4 W	17 216 06	1
34	R65	RESISTOR, 3.9K, 5%, 1/4 W	17 215 52	1
35	R45	RESISTOR, 15K, 5%, 1/4 W	17 214 57	1
36	R44, R47, R48, R50, R51, R52, R72, R75, R76, R79, R82, R90, R91, R96, R97	RESISTOR, 47K, 5%, 1/4 W	17 215 02	15
37	R21, R42, R89, R92	RESISTOR, 2K, 5%, 1/4 W	17 215 08	4
38	R40, R43, R93	RESISTOR, 470K, 5%, 1/4 W	17 214 58	3
39	R34	RESISTOR, 10 OHM, 5%, 1/4 W	17 215 53	1
40	R67, R99	RESISTOR, 4.7K, 5%, 1/4 W	17 215 00	2
41	R19, R22, R63	POTENTIOMETER, 10K, CARB, PCB VERT.	17 529 61	3
42	R88	POTENTIOMETER, 5K, CARB, PCB VERT.	17 529 65	1
43	R85	POTENTIOMETER, 1K, CARB, PCB VERT.	17 529 60	1
44	R95	RESISTOR, 3K, 1%, 1/4 W	17 214 44	1
45	C16	CAPACITOR, 0.22 UF, 25V	17 430 04	1
46	T2	TRANSFORMER, PULSE	17 604 10	1
47	C17	CAPACITOR, 1 UF, 50V	17 405 23	1
48	Q2	TRANSISTOR, 2N4126	17 625 57	1
49	Q3	TRANSISTOR, 2N4893	17 627 08	1
50	Q4, Q5, Q14, Q15, Q16, Q17, Q18, Q19, Q20, Q21, Q22, Q23	TRANSISTOR, 2N4124	17 625 58	12
51	Q13	TRANSISTOR, 2N5457	17 627 05	1
52	R1	RESISTOR, 10K, 5%, 1 W	17 216 31	1
53	R3, R100	RESISTOR, 1.3K, 5%, 1-1/2 W	17 216 30	2
54	R98	RESISTOR, 27K, 5%, 1/4 W	17 215 39	1

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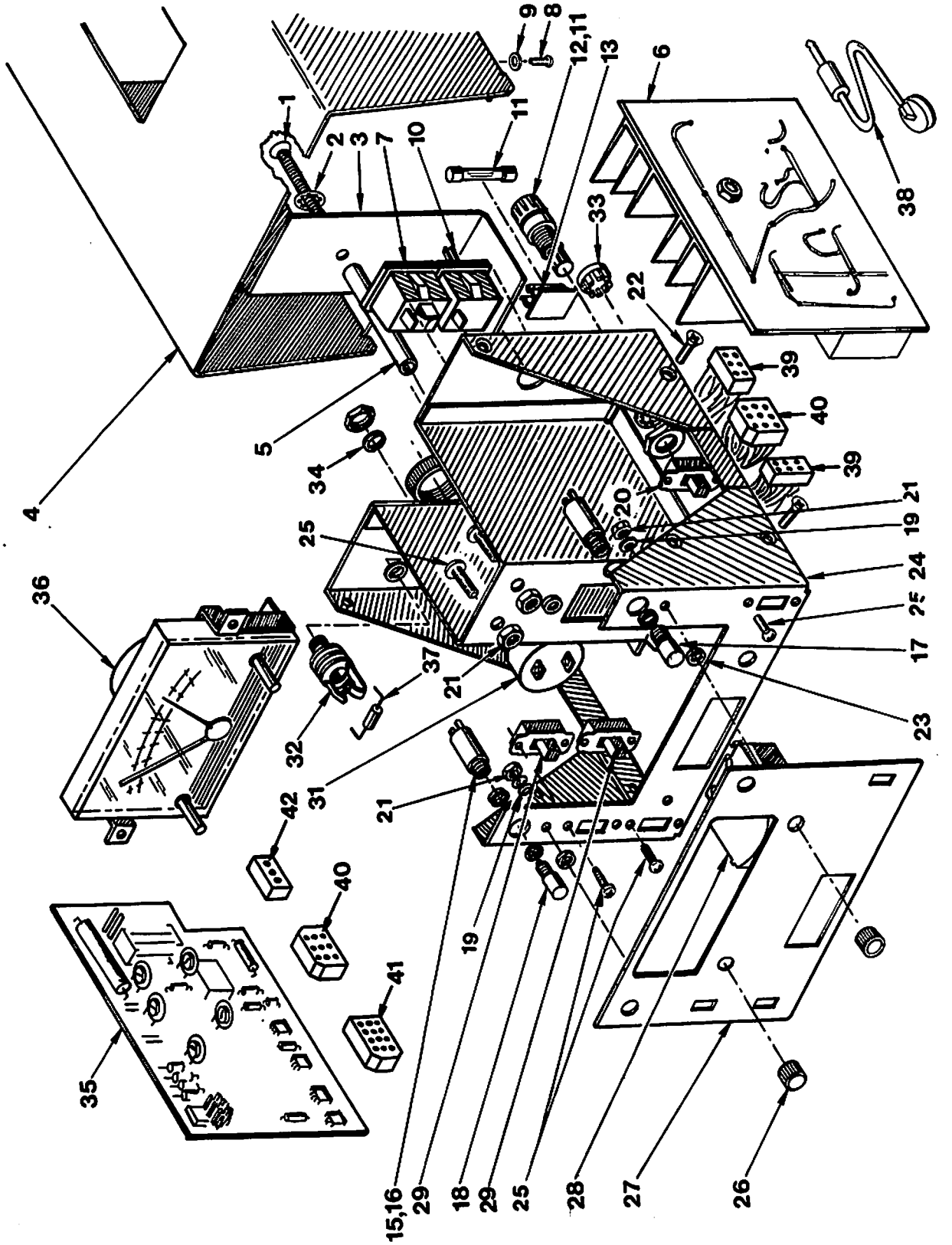


FIGURE 6.7 SERVO CONTROLLER (SC78-2), PARTS LOCATION DIAGRAM

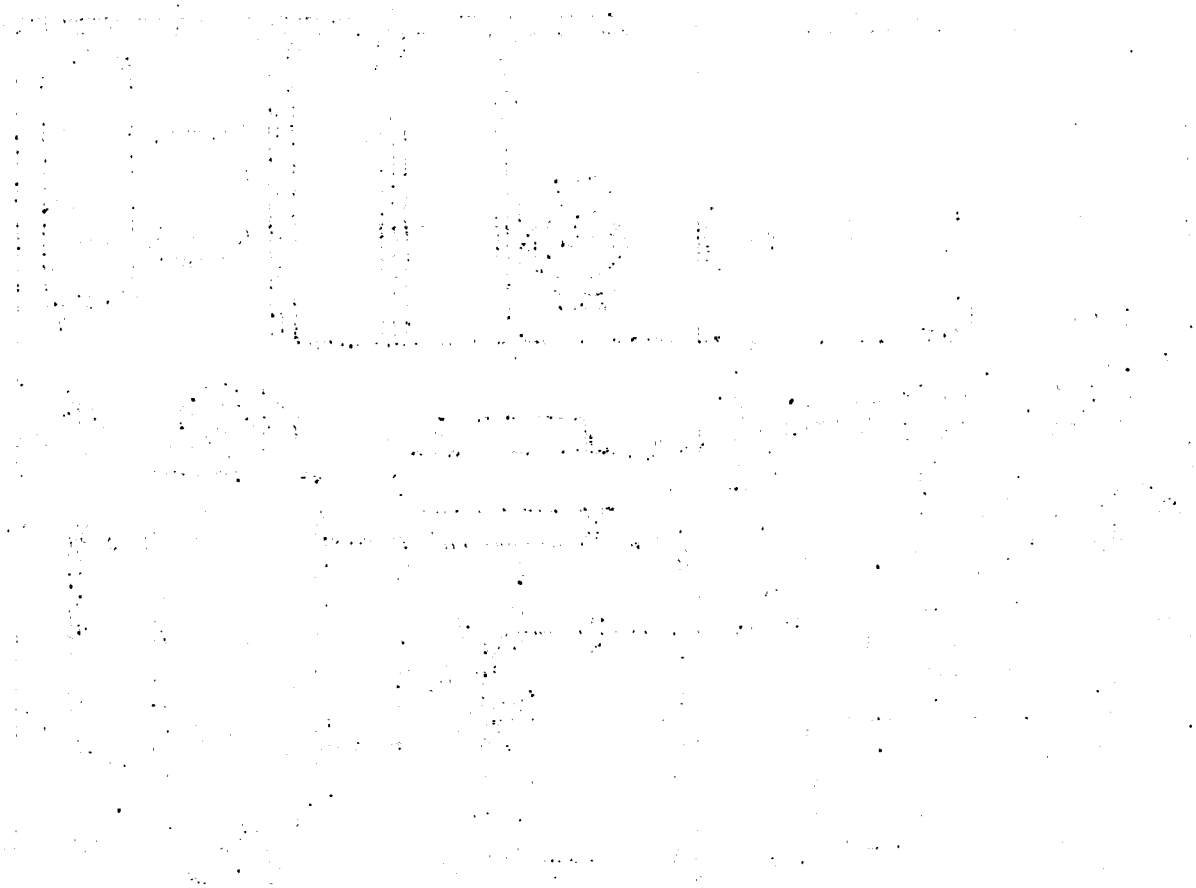
TABLE 6.7 SERVO CONTROLLER (SC78-2), PARTS LIST (SHEET 1 OF 2)

PART NO. 78 300 80 - 110/120V, 60 HZ
PART NO. 78 300 81 - 110/120V, 50 HZ
PART NO. 78 300 82 - 220/240V, 60 HZ
PART NO. 78 300 83 - 220/240V, 50 HZ
PART NO. 78 300 84 - 100V, 60 HZ
PART NO. 78 300 85 - 100V, 50 HZ

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.7				
1		SCREW, NO. 10-32 x 4, LG, RD, SL, S, CA	99 046 40	1
2		WASHER, NO. 10, LK, SHI, S4	99 123 92	1
3		COVER PLATE	78 300 50	1
4		COVER	78 300 20	1
5		SPACER	78 300 56	1
6	PCB 1A	P.C.B. NO. 1A ASSEMBLY (110-120V)	78 310 80	1
		P.C.B. NO. 1A ASSEMBLY (220-240V)	78 310 81	1
		P.C.B. NO. 1A ASSEMBLY (100V)	78 310 82	1
7	P3	SOCKET, AC	17 722 37	1
8		SCREW, NO. 4-40 x 1/4, TR, PH, SS	99 010 56	4
9		WASHER, NO. 4, LK, SHI, S4	99 121 35	4
10	P2	PLUG, AC	17 722 46	1
11	F1	FUSE, 8 AMP QUICK ACTING (100/120V)	17 726 48	2
		FUSE, 5 AMP QUICK ACTING (220-240V)	17 718 60	2
12	XF1	FUSE HOLDER	17 700 31	1
13		FUSE HOLDER, SPARE	77 000 65	1
14		NOT USED		
15	XDS1-XDS2	SOCKET, BULB	17 725 32	2
16	DS1-DS2	BULB, NO. 345	17 806 45	2
17		CAP, LENS, WHITE	17 806 44	1
18		CAP, LENS, RED	17 806 46	1
19		WASHER, FL #6, SS	99 122 03	4
20	S1	SWITCH, SLIDE, DPST	17 681 88	1
21		NUT, NO. 6-32, HX, KEPS, S, CA	99 105 34	5
22		SCREW, NO. 6-32 x 1/4, FL, PH, SS, (100°C)	99 022 77	8
23		WASHER, NYLON	99 122 50	3
24		CHASSIS, MARKED (220-240V, 60 Hz)	78 300 39	1
		CHASSIS, MARKED (220-240V, 50 Hz)	78 300 40	1
		CHASSIS, MARKED (110-120V, 60 Hz)	78 300 41	1
		CHASSIS, MARKED (110-120V, 50 Hz)	78 300 42	1
		CHASSIS, MARKED (100V, 50 Hz)	78 300 43	1
		CHASSIS, MARKED (100V, 60 Hz)	78 300 44	1
25		SCREW, NO. 6-32 x 1/4, TR, PH, SS	99 022 72	8
26		KNOB	17 060 60	2
27		PANEL, FRONT, MARKED	78 300 66	1
28	M2	METER (110-120V)	17 776 59	1
		METER (220-240V)	17 776 60	1
		METER (100V)	17 777 10	1
29	S2, S3	SWITCH, SLIDE, DPDT	17 681 87	2
30		NOT USED		
31	DS3	SONALERT	17 652 21	1
32	J4	JACK	17 712 30	1
33		PLUG, BUTTON	22 059 60	1
34		WASHER, LK, SHI, 3/8 PH, BZ	99 126 96	1
35	PCB-2A	P.C.B. NO. 2A ASSEMBLY (100-110-120V, 60 HZ)	78 311 72	1

TABLE 6.7 SERVO CONTROLLER (SC78-2), PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
		P.C.B. NO. 2A ASSEMBLY (100-110-120V, 50 HZ & 220-240V, 50 HZ)	17 311 77	1
36	M1, R20*, R14*,	METER ASSEMBLY	78 301 70	1
37	R87	RESISTOR, 1100 OHM, 1/8W, 1%	17 A# 196	1
38		PROBE, TEMP SENSING	17 575 14	1
39	P6, P7	CONNECTOR HOUSING 6 TERM	17 725 32	2
		TERMINAL, FEMALE	17 725 36	10
		TERMINAL, MALE	17 725 35	2
40	P5, J9	CONNECTOR HOUSING 9 TERM	17 725 33	2
		TERMINAL, FEMALE	17 725 36	16
		TERMINAL, MALE	17 725 35	2
41	P8	CONNECTOR HOUSING 12 TERM	17 725 34	1
		TERMINAL, FEMALE	17 725 36	11
		TERMINAL, MALE	17 725 35	1
42	J10	CONNECTOR HOUSING 3 TERM	17 725 31	1
		TERMINAL, FEMALE	17 725 36	2
		TERMINAL, MALE	17 725 35	1
	*R14, R20	POTENTIOMETER, 10K, 5W	17 529 46	2



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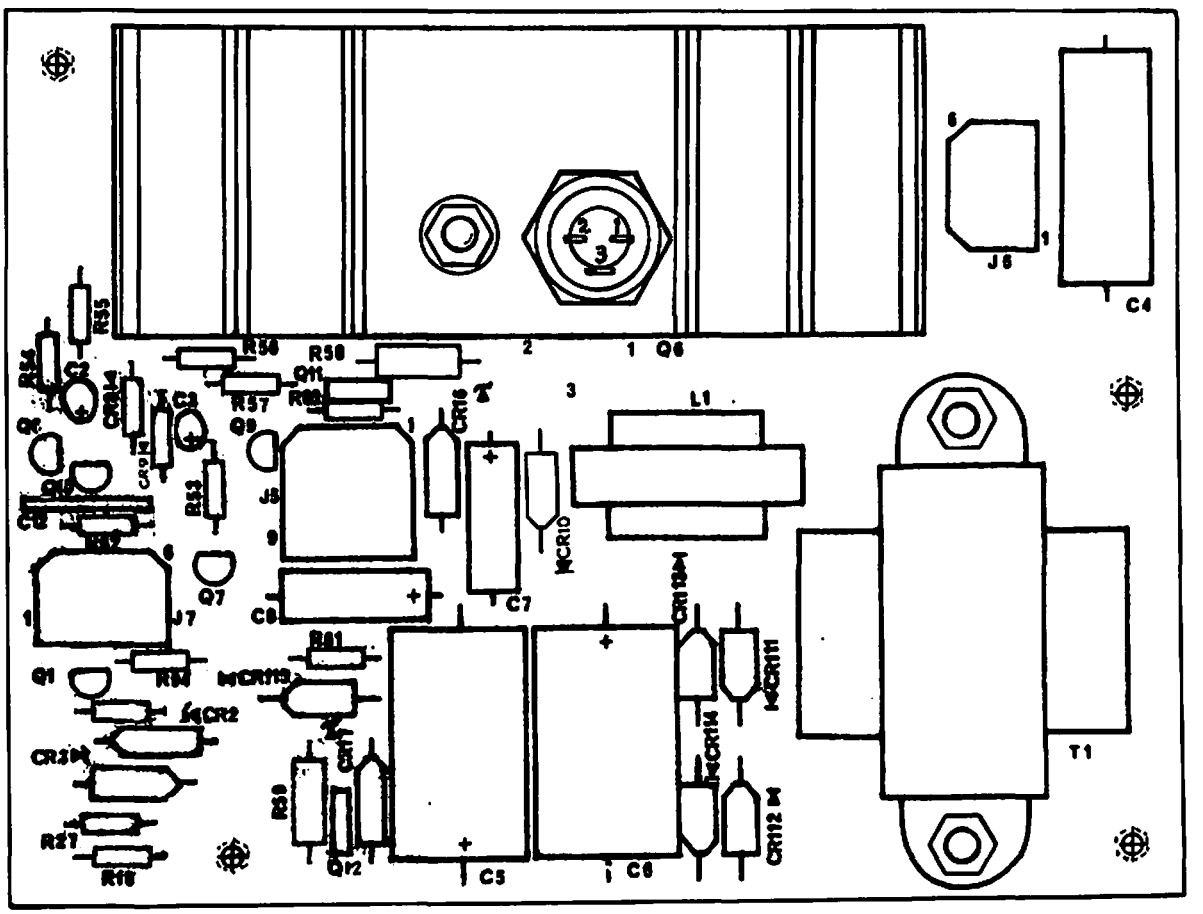

FIGURE 6.8 PCB 1A, SERVO CONTROLLER (SC78-2), PARTS LOCATION DIAGRAM

TABLE 6.8 PCB 1A, SERVO CONTROLLER (SC78-2), PARTS LIST (SHEET 1 OF 2)

PART NO. 78 310 80 - 110/120V, 50/60 HZ
PART NO. 78 310 81 - 220/240V, 50/60 HZ
PART NO. 78 310 82 - 100V, 50/60 HZ

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.8				
1		NOT USED		
2		NOT USED		
3		HEAT SINK, IERC E3 SERIES	78 310 10	1
4		SCREW, NO. 4-40 x 5/8, TR, SL, SS	99 011 95	1
5		NUT, NO. 4-40, HX, KEPS, S, CAD	99 103 33	1
6		WASHER, FL, SS	99 121 20	1
7		SCREW, NO. 8-32 x 5/16, TR, PH, SS	99 031 05	2
8		NUT, NO. 8-32, HX, KEPS, S, CAD	99 106 32	2
9		NUT, 1/4-28, HX, SS, JM	99 109 81	1
10	C5, C6	CAPACITOR, 680 UF, 25V	17 405 06	2
11	C7, C8	CAPACITOR, 25 UF, 25V	17 405 28	2
12	C4	CAPACITOR, 0.1 UF, 630V	17 410 31	1
13		NOT USED		
14		NOT USED		
15		STANDOFF, HEX, 6-32 x 0.25	99 116 63	4
16	L1	CHOKE, 120µH	17 585 13	1
17		NOT USED		
18	J6, J7	CONNECTOR, 6 PIN	17 724 67	2
19	J5	CONNECTOR, 9 PIN	17 724 68	1
20		NOT USED		
21	CR111, CR112, CR113, CR114, CR115, CR10	DIODE, 1N2483	17 502 05	6
22		NOT USED		
23	CR16, CR17	DIODE, ZENER, 1N4742A	17 502 21	2
24	CR2	DIODE, ZENER, 1N4744A	17 502 38	1
25		NOT USED		
26		NOT USED		
27	R58, R59	RESISTOR, 390 OHM, 1/2W, 5%	17 211 49	2
28	R18, R61, R83	RESISTOR, 200 OHM, 1/4W, 5%	17 216 01	3
29		NOT USED		
30		NOT USED		
31		NOT USED		
32		NOT USED		
33		WASHER, FL SS #8 µH	99 122 62	2
34		COMPOUND, DOW CORNING	99 901 29	AR
35	T1	TRANSFORMER, POWER (110-120V)	17 604 18	1
		TRANSFORMER, POWER (100V)	17 604 32	1
		TRANSFORMER, POWER (220-240V)	17 604 24	1
36	Q11	TRANSISTOR, 2N4921	17 627 10	1

TABLE 6.8 PCB 1A SERVO CONTROLLER (SC78-2), PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
37	Q12	TRANSISTOR, 2N4918	17 627 11	1
38		NOT USED		
39		NOT USED		
40	Q6	TRIAC, 2N6164 (100-110-120V)	17 550 64	1
		TRIAC, 2N6165 (220-240V)	17 550 65	1
41		NOT USED		
42		WIRE, 18 AWG, WHT	17 717 29	AR
43		SLEEVING, INSUL.	17 020 55	AR
44		WIRE, BUSS 22 AWG	17 715 50	AR

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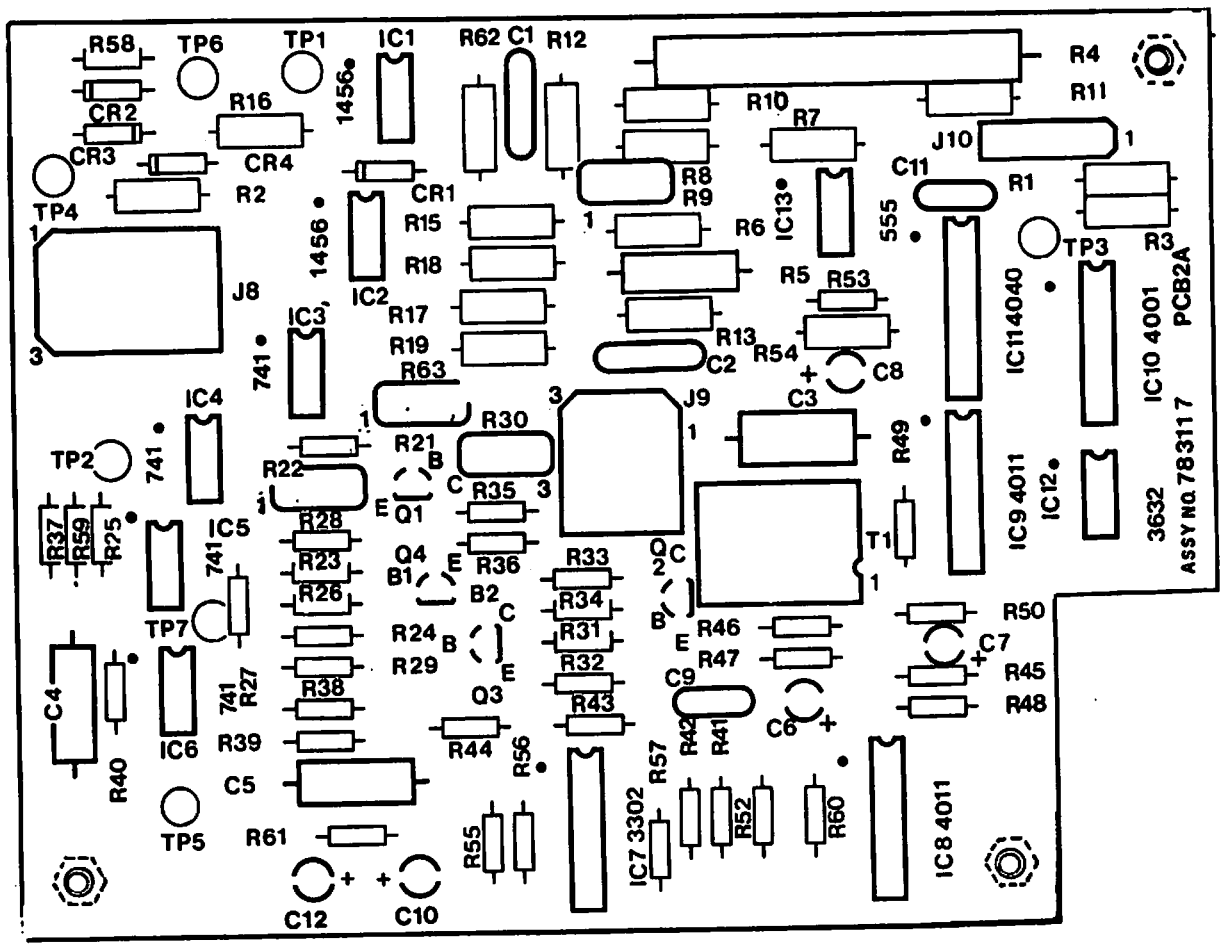

FIGURE 6.9 PCB 2A, SERVO CONTROLLER (SC78-2), PARTS LOCATION DIAGRAM

TABLE 6.9 PCB 2A, SERVO CONTROLLER (SC78-2) PARTS LIST (SHEET 1 OF 2)

PART NO. 78 311 72 (110/120V, 220/240V 60 HZ)
PART NO. 78 311 77 (100V, 110/120V, 220/240V 50 HZ)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.9				
1		NOT USED		
2		NOT USED		
3		NOT USED		
4		NOT USED		
5		NOT USED		
6	C8	CAP. 0.47 uF, 50V	17 AW 208	1
7	C1, C2	CAP. 0.47 uF, 50V	17 430 03	2
8	C3	CAP. 0.22 uF, 100V	17 AY 085	1
9	C4, C5	CAP. 0.47 uF, 100V	17 AY 097	2
10	C5	CAP. 2.2 uF, 50V	17 AW 218	1
11	C7, C10, C12	CAP. 10 uF, 25V	17 AW 236	3
12	C9, C11	CAP. 0.01 uF, 100V	17 BF 151	2
13	R1, R3	RES. 1300 OHMS, 5%, 1.5W	17 216 30	2
14	R4	RES. 10K, 5%, 11W	17 216 31	1
15	R5	RES. 680 OHMS, 5%, 3.75W	17 216 03	1
16	R2	RES. 1193 OHMS, 0.1%, 1/8W	17 212 50	1
17		NOT USED		
18	R8, R15, R18, R62	RES. 1K, 1%, 1/4W	17 AH 192	4
19	R6	RES. 3.01K, 1%, 1/4W	17 AH 238	1
20	R17, R19	RES. 3.83K, 1%, 1/4W	17 AH 248	2
21	R7	RES. 10K, 1%, 1/4W	17 AH 288	1
22	R16	RES. 30.1K, 1%, 1/4W	17 AH 334	1
23	R10, R11	RES. 100K, 1%, 1/4W	17 AH 384	2
24	R54	RES. 1.0M, 1%, 1/4W	17 AH 480	1
25	R12, R13	RES. 499K, 1%, 1/4W	17 AH 451	2
26		NOT USED		
27	R9	RES. VARIABLE, 1K, HORIZ.	17 AN 012	1
26	R63	RES. VARIABLE, 5K, HORIZ.	17 AN 016	1
29	R22, R30	RES. VARIABLE, 10K, HORIZ.	17 AN 018	1
30	R35	RES. 10 OHMS, 5%, 1/4W	17 AA 073	1
31	R58	RES. 150 OHMS, 5%, 1/4W	17 AA 157	1
32	R61	RES. 470 OHMS, 5%, 1/4W	17 AA 193	1
33	R36	RES. 820 OHMS, 5%, 1/4W	17 AA 211	1
34	R42, R43, R44	RES. 1K, 5%, 1/4W	17 AA 217	3
35	R21, R23	RES. 2K, 5%, 1/4W	17 AA 238	2
36	R29	RES. 3K, 5%, 1/4W (60 HZ)	17 AA 250	1
36A	R29	RES. 3.6K, 5%, 1/4W (50 HZ)	17 AA 256	1
37		NOT USED		
38	R31, R32, R33, R34, R48, R50, R52, R60	RES. 10K, 5%, 1/4W	17 AA 289	8
40	R24, R25	RES. 20K, 5%, 1/4W	17 AA 310	2
41	R26, R59	RES. 47K, 5%, 1/4W	17 AA 337	2

(Cont. on 1)

TABLE 6.9 PCB 2A, SERVO CONTROLLER (SC78-2), PARTS LIST (SHEET 1 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
42	R27, R28, R45, R46, R47, R53, R56	RES. 100K, 5%, 1/4W	17 AA 361	7
43	R49	RES. 220K, 5%, 1/4W	17 AA 385	1
44	R37, R38, R39, R40	RES. 470K, 5%, 1/4W	17 AA 409	4
45	R57	RES. 62K, 5%, 1/4W	17 AA 346	1
46		NOT USED		
47	IC1, IC2	IC, MC1456	17 629 39	2
48	IC13	IC, NE555	17 629 56	1
49	IC7	IC, 3302	17 629 58	1
50	IC3, IC4, IC5, IC6	IC, 741	17 629 69	4
51	IC10	IC, CMOS, 4001	17 629 75	1
52	IC8, IC9	IC, CMOS, 4011	17 629 77	2
53	IC11	IC, CMOS, 4040	17 629 89	1
54	IC12	IC, 3632	17 630 04	1
55		NOT USED		
56	Q1	TRANSISTOR 2N4126	17 625 57	1
57	Q2, Q3	TRANSISTOR 2N4124	17 625 58	2
58	Q4	TRANSISTOR 2N4893	17 627 08	1
59		NOT USED		
60	T1	TRANSFORMER	17 604 10	1
61		NOT USED		
62	CR4	DIODE, ZENER 1N4735A	17 AR 015	1
63	CR1, CR2, CR3	DIODE, 1N914A	17 AR 501	3
64		NOT USED		
65	J10	CONN, 3 PIN	17 724 66	1
66	J9	CONN, 9 PIN	17 724 68	1
67	J8	CONN, 12 PIN	17 724 69	1
68	TP1, TP2, TP3, TP4, TP5, TP6, TP7	TERMINAL, PIN, MALE	17 729 43	7
69		STANDOFF, HEX, 6-32 x .25, PCB MTG.	99 116 63	4

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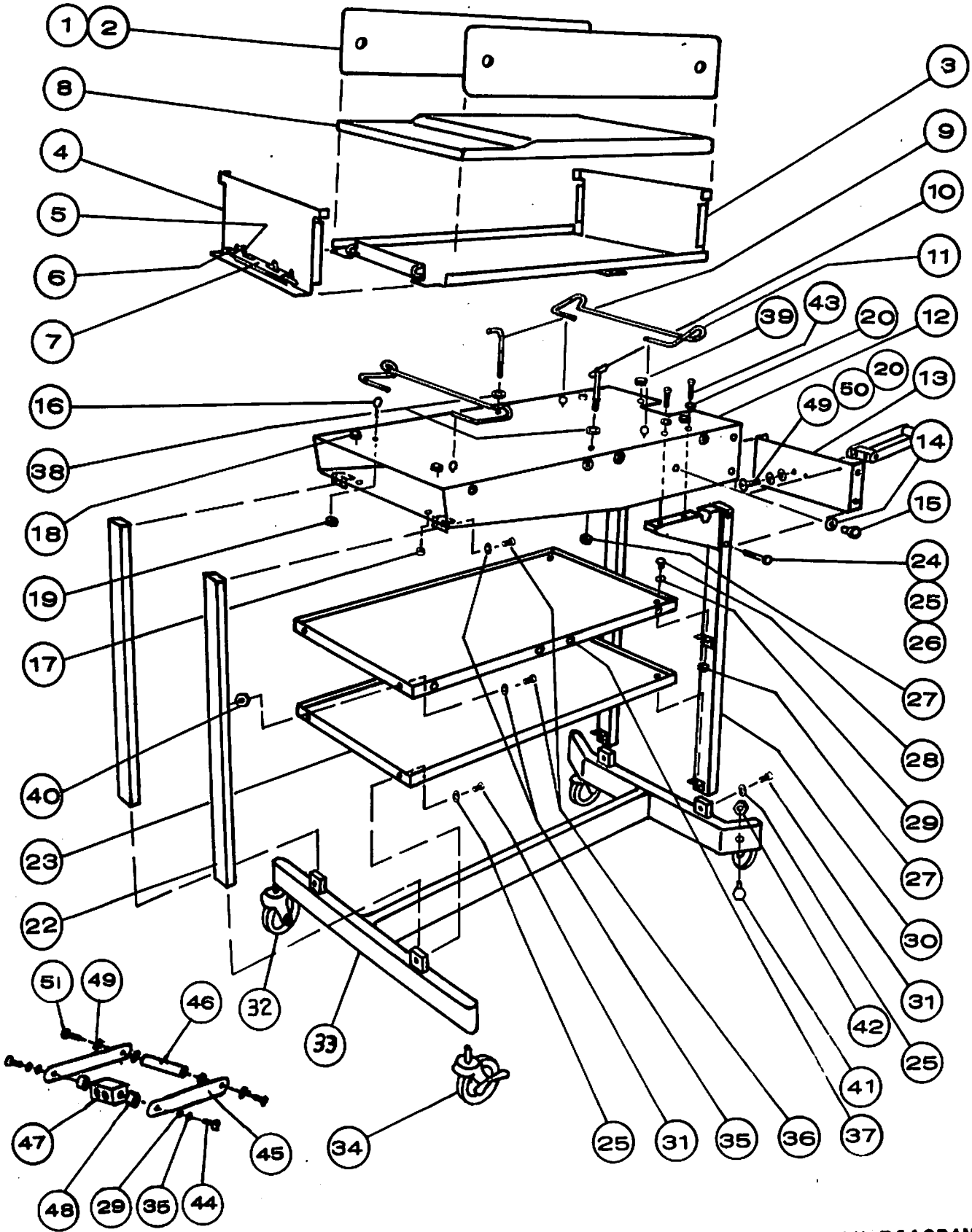

FIGURE 6.10 STANDARD CART/BASSINET ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.10 STANDARD CART ASSEMBLY, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 100 95

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.10				
1		PANEL, SIDE (STAINLESS STEEL)	78 101 30	2
2		PANEL, SIDE (HOMALITE)	78 101 35	2
3		BASSINET, WELDMENT	78 102 70	1
4		END PANEL, WELDMENT (LESS HARDWARE)	78 101 70	1
5		HANDLE	78 101 15	2
6		PLUNGER	78 101 10	2
7		SPRING	78 101 00	1
8		MATTRESS	21 000 21	1
9		GUIDE POST	78 101 21	1
10		GUIDE POST ASSEMBLY	78 104 70	1
11		SUPPORT, BASSINET	78 101 45	2
12		CART TOP ASSEMBLY	78 101 77	1
13		MOUNTING PLATE	78 201 48	1
14		SPACER, SIDE STORAGE	78 110 30	2
15		KNOB, SIDE STORAGE	78 101 64	2
16		PIVOT, SCREW	78 101 46	4
17		GROMMET	78 010 62	2
18		BUMPER	78 102 65	4
19		NUT, NO. 6-32, HX, KEPS, S, CAD	99 105 34	4
20		WASHER, 10 LK, SHI, SS	99 123 92	6
21		NOT USED		
22		SUPPORT, FRONT	78 100 57	2
23		SHELF	78 100 06	2
24		SCREW, 3/8-16 x 2-1/2, CARRIAGE, S, CA	99 068 32	4
25		WASHER, 3/8, LK, SP, S, CA	99 126 92	8
26		NUT, 3/8-16, ACORN, S, CAD	99 115 18	4
27		NUT, 1/4-20, HX, KEPS, S, CAD	99 109 41	6
28		SCREW, 1/4-20 x 1/2, TR, PH, SS	99 055 84	4
29		WASHER, 1/4, FL, SS	99 125 23	8
30		SUPPORT, REAR	78 100 56	2
31		SCREW, 3/8-16 x 3/4, CP, HX, SS	99 067 30	4
32		CASTER, W/O BRAKE	20 025 30	2
33		BASE, WELDMENT	78 100 13	1
34		CASTER, W/BRAKE	78 100 60	2
35		WASHER, 1/4, LK, SP, SS	99 125 53	8
36		SCREW, 1/4-20 x 1/2, CP, HX, SS	99 055 75	6
37		PLUG BUTTON	22 035 40	8

TABLE 6.10 STANDARD CART ASSEMBLY PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY. PER ASSY.
38		NUT, ROD	78 102 25	2
39		PLUG BUTTON	78 101 28	2
40		NUT, 1/4-20 "NUTSERT"	99 109 56	2
41		SCREW, 3/8-16 x 3 HX, S, CA	99 068 60	1
42		NUT, 3/8-16 HX, ES, S, CA	99 111 25	1
43		SCREW, 10-32 x 3/8 TR, PH, SS	99 041 27	4
44		SCREW, 1/4-20 x 3/4, RD, SLDT, S, CA	99 056 98	2
45		ARM, CATCH	78 200 05	2
46		CATCH, WARMER POST	78 200 30	1
47		BLOCK, MTG.	78 200 12	1
48		SPACER, POST BLOCK	78 201 40	2
49		WASHER NO. 10 FLAT SS	99 123 64	6
50		SCREW NO. 10-32 x 1/2 TR, PH, SS	99 042 01	2
51		SCREW NO. 10-32 x 5/8 TR, PH, SS	99 042 58	2

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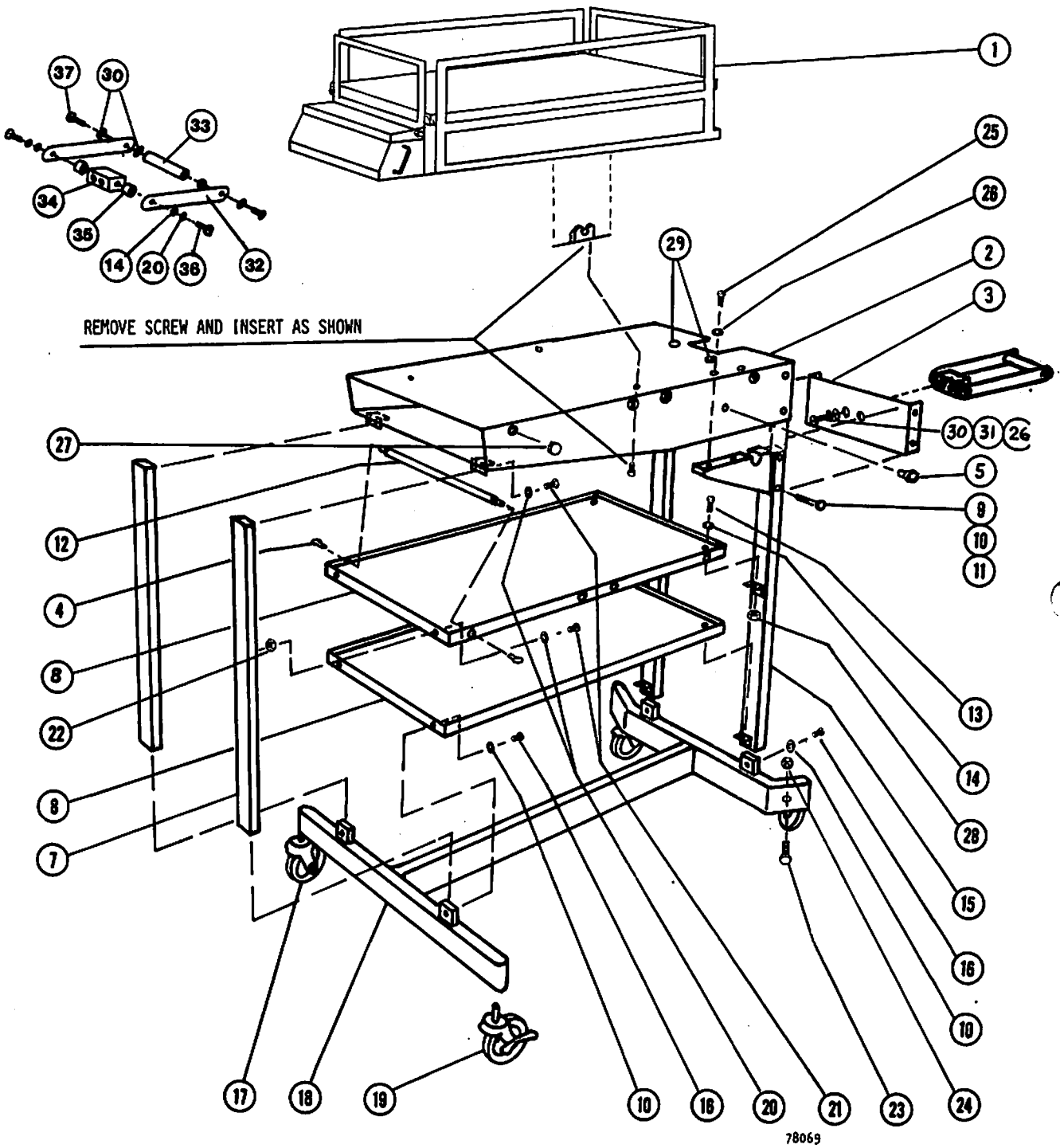

FIGURE 6.11 INTENSIVE CARE CART ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.11 INTENSIVE CARE CART ASSEMBLY, PARTS LIST

PART NO. 78 111 71, 72, 73

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.11				
1		BASSINET INTENSIVE CARE (REFER TO FIG. 6.15 FOR BREAKDOWN)	78 140 70	-
2		CART TOP ASSEMBLY	78 103 02	1
3		MOUNTING PLATE	78 201 48	1
4		BUSHING	78 102 50	2
5		PLUG, BUTTON	21 000 50	2
6		NOT USED		
7		SUPPORT, FRONT	78 100 57	2
8		SHELF	78 100 06	2
9		SCREW, 3/8-16 x 2-1/2, CARRIAGE, S, CA	99 068 32	4
10		WASHER, 3/8, LK, SP, S, CAD	99 126 92	8
11		NUT, 3/8-16, ACORN, S, CAD	99 115 18	4
12		TUBING	78 102 55	AR
13		SCREW, 1/4-20 x 1/2, TR, PH, SS	99 055 84	4
14		WASHER, 1/4, FL, SS	99 125 23	8
15		SUPPORT, REAR	78 100 56	2
16		SCREW, 3/8-16 x 3/4, CP, HX, SS	99 067 30	4
17		CASTER, W/O BRAKE	20 025 30	2
18		BASE, WELDMENT	78 100 13	1
19		CASTER, W/BRAKE	78 100 60	2
20		WASHER, 1/4 LK, SP, SS	99 125 53	6
21		SCREW, 1/4-20 x 1/2, CP, HX, SS	99 055 75	6
22		NUT 1/4-20 "NUTSERT"	99 109 56	2
23		SCREW 3/8-16 x 3 HX, SCH	99 068 60	1
24		NUT 3/8-16 HX, ES, SCA	99 111 25	1
25		SCREW 10-32 x 3/8 TR, PH, SS	99 041 27	4
26		WASHER, 10 LK, SHI SS	99 123 92	6
27		PLUG, BUTTON	22 035 40	2
28		NUT 1/4-20 HX, KEPS, S, CAD	99 109 41	4
29		PLUG, BUTTON	78 101 28	2
30		WASHER NO. 10 FLT, SS	99 123 64	6
31		SCREW NO. 10-32 x 1/2 TR, PH, SS	99 042 01	2
32		ARM, CATCH	78 200 05	2
33		CATCH, WARMER POST	78 200 30	1
34		BLOCK, MTG	78 200 12	1
35		SPACER, POST BLOCK	78 201 40	2
36		SCREW, 1/4-20 x 3/4, RD, SL, S, CA	99 056 98	2
37		SCREW 10-32 x 5/8 TR, PH, SS	99 042 58	2

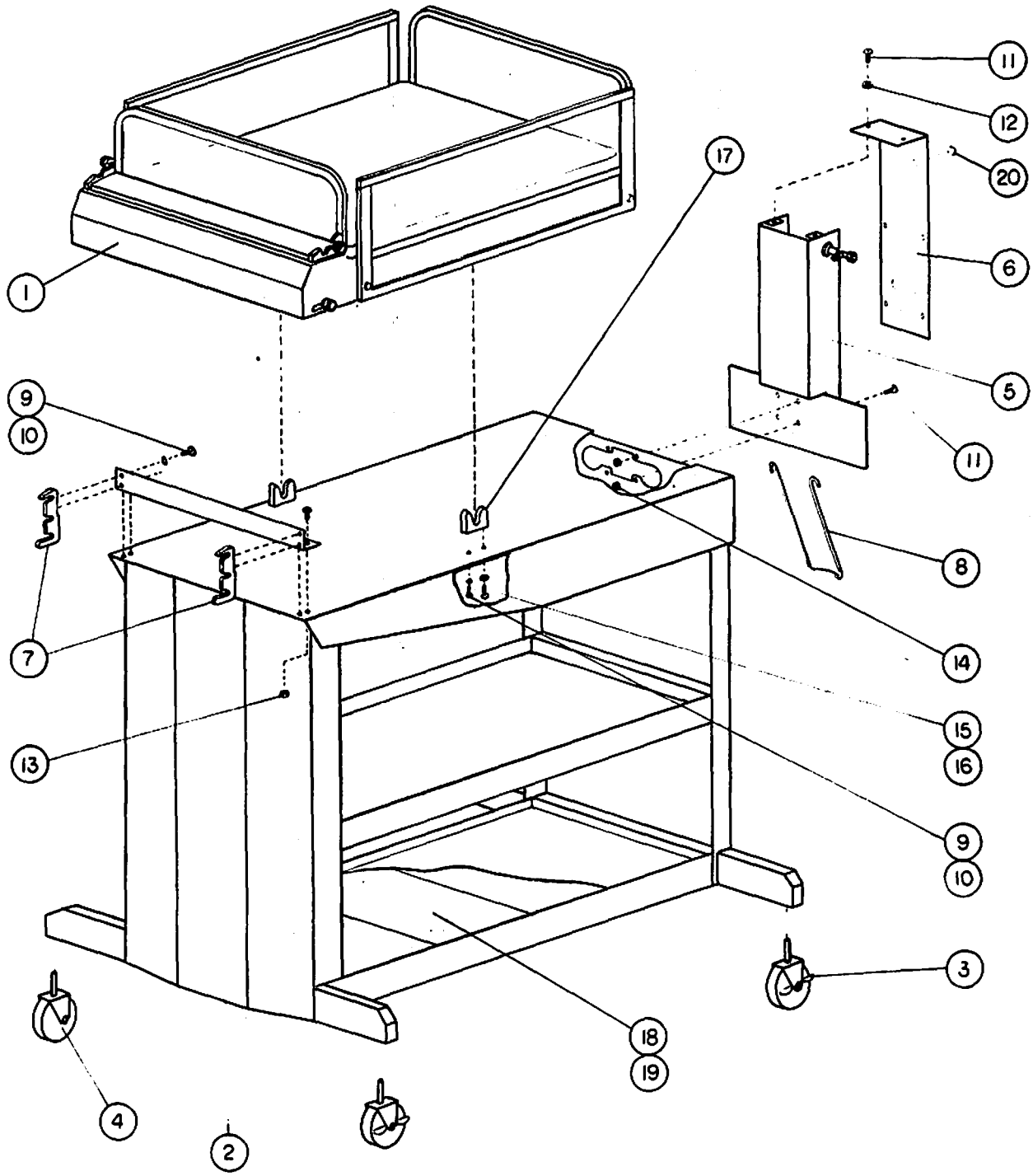

FIGURE 6.12 INTENSIVE CARE BASIC WELD CART ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.12

INTENSIVE CARE BASSINET BASIC WELD CART ASSEMBLY, PARTS LIST

PART NO. 78 100 90

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.12				
1		INTENSIVE CARE BASSINET ASSEMBLY (REFER TO FIGURE 6-16 FOR BREAKDOWN)	78 140 71	1
2		SPECIAL PROCEDURES CART, BASIC WELD	78 112 01	1
3		CASTER WITH BRAKE	78 100 60	2
4		CASTER WITHOUT BRAKE	20 035 30	2
5		PANEL, ACCESSORY	78 400 06	1
6		COVER, ACCESSORY, PANEL	78 400 10	1
7		ADJUST, BRACKET, MACH.	78 141 11	2
8		RETAINER	78 112 15	1
9		SCREW, 8-32 x 3/8, TR, PH SS	99 031 38	10
10		WASHER, NO. 8, LK, SHI, S4	99 122 92	6
11		SCREW, 10-32 x 3/8, TR, PH SS	99 041 27	10
12		WASHER, NO. 10, LK, SHI, SS	99 123 92	6
13		NUT, 8-32, HX, KEPS, S, CA	99 106 32	4
14		NUT, 10-32, KEPS, S, CAD	99 107 36	4
15		WASHER, 1/4, LK, SHI, S4	99 125 54	
16		SCREW, 1/4-20 x 3/8, RD, PH, SS	99 065 03	2
17		PIVOT BLOCK, MACH.	78 141 06	2
18		BALLAST, BLOCK	78 112 30	4
19		BAG, POLY. 18 x 24 x 0.0015	99 900 47	4
20		BUMPER	34 224 30	4

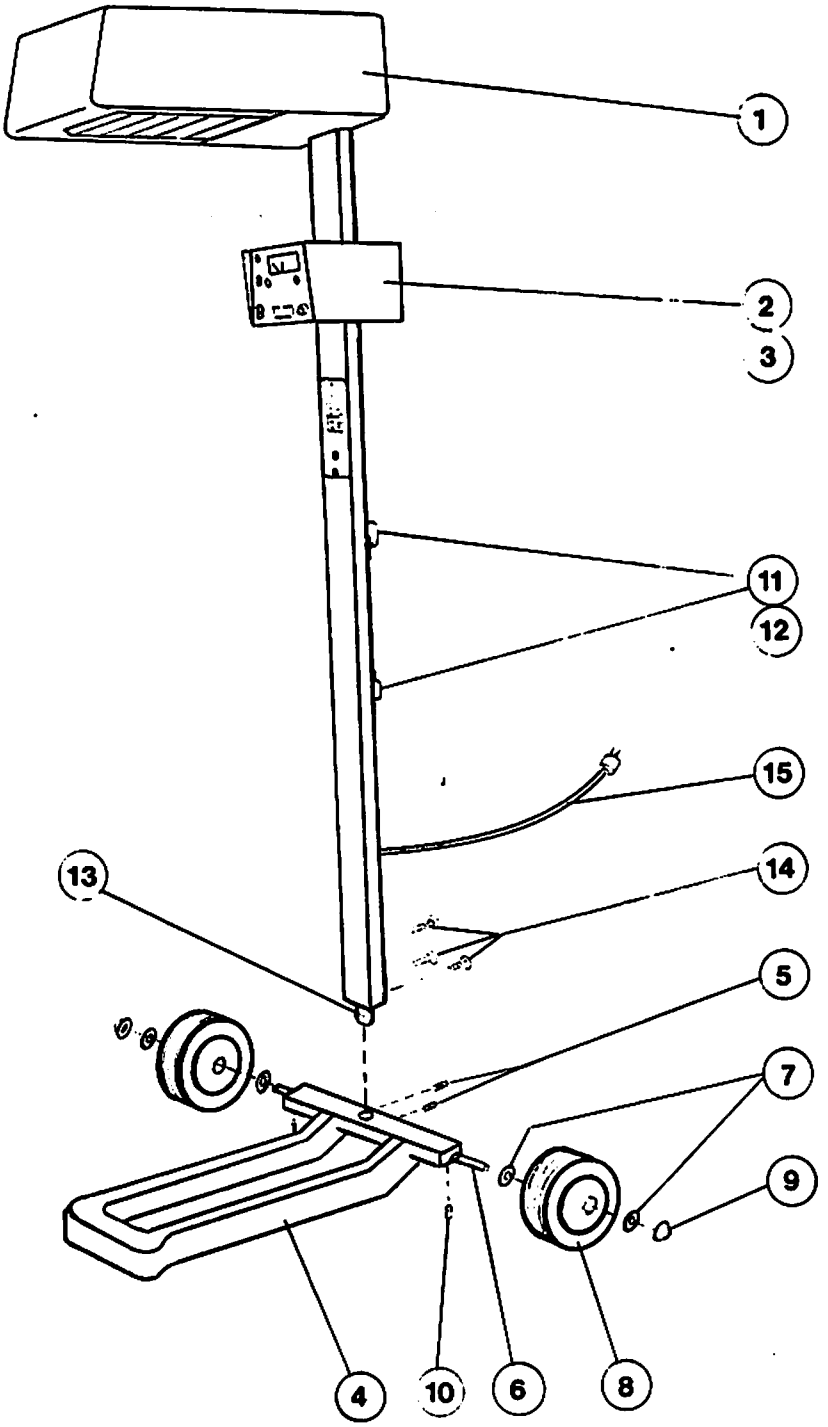

FIGURE 6.13 MOBILE INFANT WARMER, PARTS LOCATION DIAGRAM

TABLE 6.13 MOBILE INFANT WARMER, PARTS LIST

PART NO. 78 600 71
PART NO. 78 600 72

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.13				
1		WARMER MODULE AND POST (REFER TO TABLE 6.14 AND FIGURE 6.14 FOR PARTS BREAKDOWN)		
2, 3		MANUAL OR SERVO CONTROLLER (REFER TO TABLES 6.2 THROUGH 6.9 AND FIGURES 6.2 THROUGH 6.9 FOR PARTS BREAKDOWN)		
4		BASE CASTING	76 610 01	1
5		SCREW, 5/16 ID x 9/16 OD x 1/16 THK	99 126 40	4
8		WHEEL ASSEMBLY (METAL)*	53 110 70	2
9		NUT	53 101 37	2
10		PIN, SPRING	99 143 80	2
11		RETAINER, POWER CORD	78 610 20	2
12		RIVET, POP USM, SS, D44, SS, BS	99 131 66	4
13		POST, MOUNTING	78 610 15	1
14		SCREW, 5/16-18 x 3/4, FL, SK, S, CA	99 064 52	3
15		POWER CORD	17 728 76	1

*When replacing plastic wheels, order retrofit kit 78 918 70

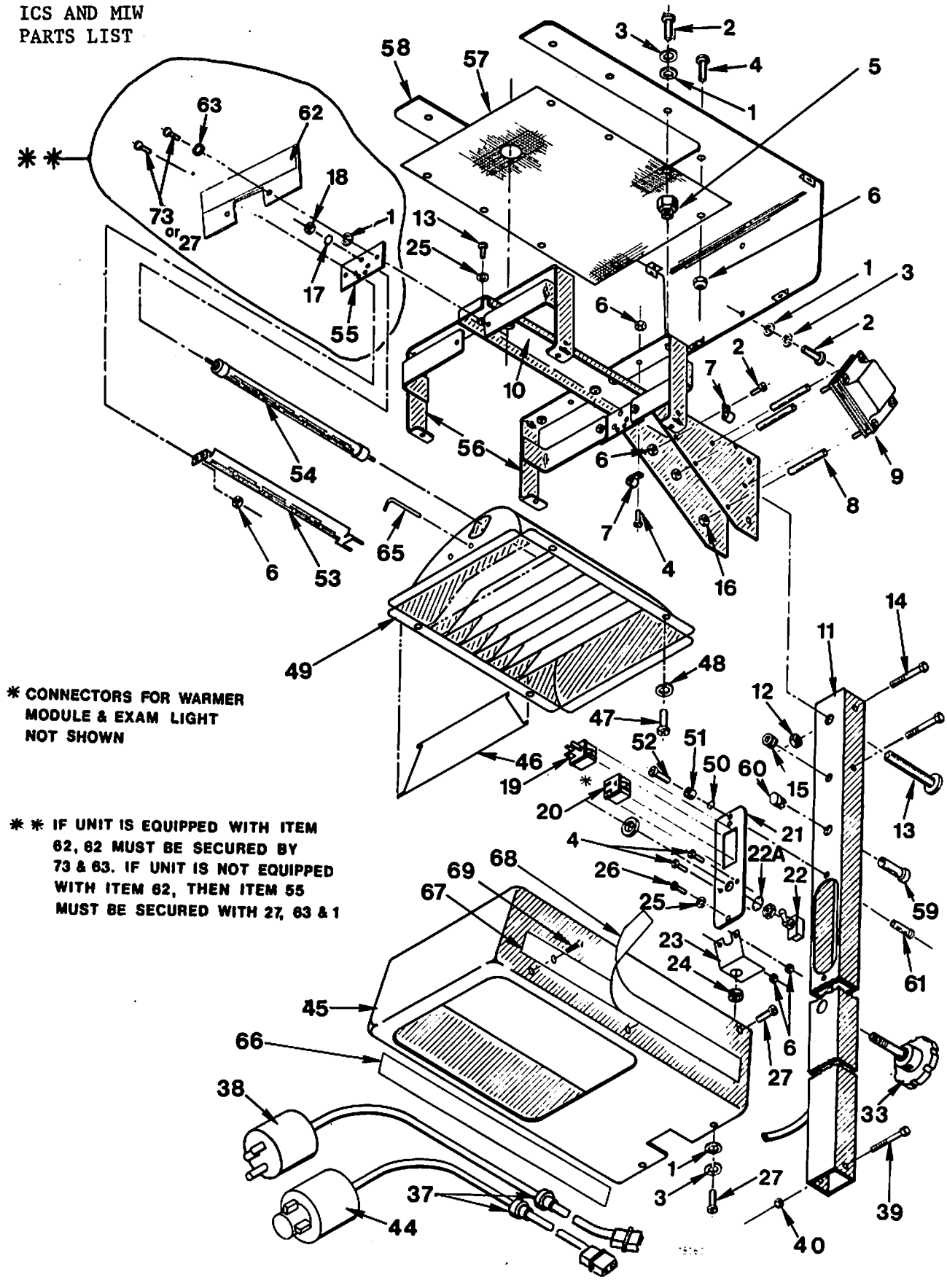
* CONNECTORS FOR WARMER MODULE & EXAM LIGHT NOT SHOWN
* * IF UNIT IS EQUIPPED WITH ITEM 62, 62 MUST BE SECURED BY 73 & 63. IF UNIT IS NOT EQUIPPED WITH ITEM 62, THEN ITEM 55 MUST BE SECURED WITH 27, 63 & 1

FIGURE 6.14 WARMER MODULE, PARTS LOCATION DIAGRAM

TABLE 6.15, INTENSIVE CARE BASSINET, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 140 70)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.15				
1		REAR PANEL ASSEMBLY	78 145 70	1
2		KNOB, PLASTIC	17 061 10	1
3		NUT, 1/4-20 SS	99 109 00	
4		MATTRESS COMPLETE (INCLUDES ITEMS 5 AND 6)	78 148 80	
5		MATTRESS	78 148 82	1
6		MATTRESS COVER	78 148 81	
7		SIDE PANEL ASSEMBLY	78 146 70	
8		FRONT PANEL ASSEMBLY	78 144 70	1
9		NOT USED		
10		SHAFT, RELEASE	78 144 20	1
11		NOT USED		
12		KNOB	17 060 62	2
13		BUSHING, FLANGED	78 144 31	2
14		ROD, ADJUSTING BRACKET	78 144 10	1
15		NOT USED		
16		SPRING, COMPRESSION	78 144 25	3
17		PIN, SPRING	99 143 97	2
18		NOT USED		
19		ROD, RELEASE	78 144 15	1
20		BLOCK, PIVOT/LATCH	78 142 01	1
21		MATTRESS SUPPORT PANEL	78 140 00	1
22		SCREW, 10-32 x 5/16 TR, PH, SS	99 040 86	8
23		WASHER, NO. 10, LK, SHI, SS	99 123 92	12
24		WHEEL, PLASTIC	78 142 45	8
25		AXLE	78 142 50	8
26		BUTTON	78 147 70	2
27		SCREW, 8-32 x 3/8, OV, PH, SS	99 031 36	2
28		SUPPORT, MATTRESS	78 143 20	1
29		BUMPER, ELASTOMERIC	78 102 65	2
30		SCREW, 8-32 x 3/8, RD, PH, SS	99 031 37	4
31		WASHER, NO. 8, LK, SHI, SS	99 122 92	4
32		RELEASE PIN ASSY., (INCLUDES ITEMS 34, 35, 36, AND 37)	78 149 70	4
33		RING, RETAINING	99 182 67	4
34		RING, RETAINING	99 182 64	1
35		HOUSING, RELEASE PIN	78 149 00	1
36		SPRING, COMPRESSION	78 149 10	1
37		PIN, RELEASE	78 149 05	1
38		SHAFT, PIVOT	78 142 30	1
39		BLOCK, PIVOT	78 141 06	2
40		BUSHING, RELEASE	78 142 36	2

TABLE 6.15, INTENSIVE CARE BASSINET, PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY. PER ASSY.
41		PLATE, MOUNTING	78 141 00	1
42		TUBE, ALIGNMENT	78 142 15	1
43		NOT USED		
44		BRACKET, SPRING	78 142 25	2
45		HANDLE, RELEASE	78 142 05	2
46		SCREW, 8-32 x 3/8, FL, SL, SS	99 031 41	2
47		SPRING, COMPRESSION	78 142 40	2
48		BRACKET, ADJUST	78 141 11	2
49		WASHER, NO. 8, LK, SHI, SS	99 122 92	4
50		SCREW, 8-32 x 3/8, RD, PH, SS	99 031 37	4
51		SPRING, EXTENSION	78 142 20	2
52		NOT USED		
53		SLEEVE, RELEASE HANDLE	78 142 10	2
54		WASHER, 1/4 ID x 5/8 OD x 1/16 THK, NL	99 182 64	4
55		WASHER, 1/4, LK, SHI, SS	99 125 54	2
56		SCREW, 1/4-20 x 3/8, RD, FL, SS	99 055 03	2
57		WIPER SPRING	78 142 55	2
58		SCREW, 4-40 x 1/4, TR, PH, SS	99 010 56	4
59		NUT, 4-40, HEX, "KEPS" S, CA	99 103 33	4
60		WASHER, 1/4 I.D. x 0.500 O.D., FL, SS, 1/32H	99 125 23	2
61		COTTER PIN, 1/16 DIA. x 3/8, S, CA	99 141 29	2

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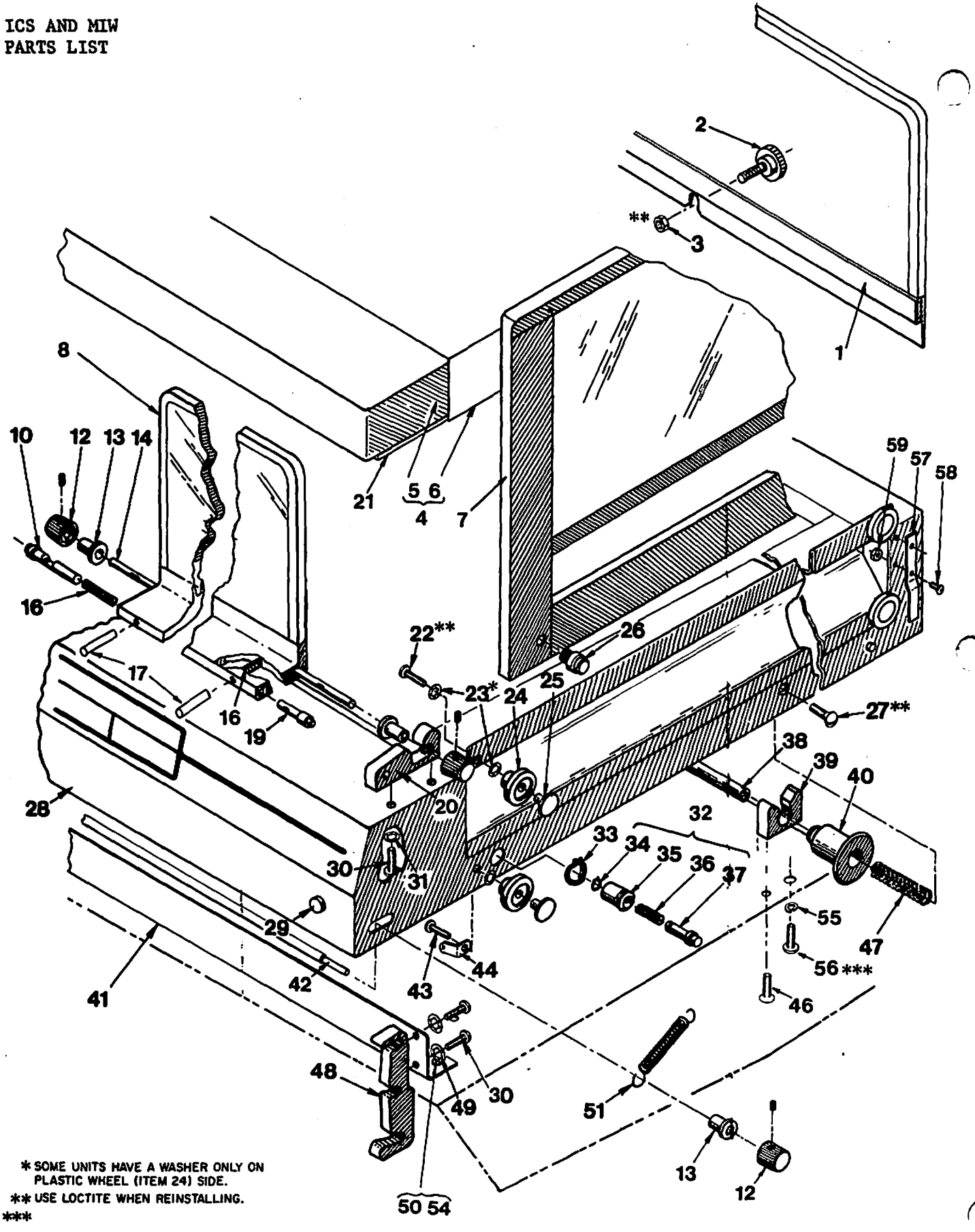

* SOME UNITS HAVE A WASHER ONLY ON PLASTIC WHEEL (ITEM 24) SIDE.
** USE LOCTITE WHEN REINSTALLING.
***

FIGURE 6.16 INTENSIVE CARE BASSINET (PART NO. 78 140 71), PARTS LOCATION DIAGRAM

TABLE 6.16 INTENSIVE CARE BASSINET, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 140 71

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.16				
1		REAR PANEL	78 145 70	1
2		KNOB, PLASTIC	17 061 10	1
3		NUT 1/4-20 SS	99 109 00	
4		MATTRESS COMPLETE (INCLUDES ITEMS 5 AND 6)	78 148 90	
5		MATTRESS	78 148 8	1
6		MATTRESS COVER	78 148 81	
7		SIDE PANEL		1
8		FRONT PANEL	78 144 70	1
9		NOT USED		
10		SHAFT, RELEASE	78 144 20	1
11		NOT USED		
12		KNOB	17 060 62	4
13		BUSHING, FLANGED	78 144 31	4
14		ROD, ADJUSTING BRACKET	78 144 10	1
15		NOT USED		
16		SPRING, COMPRESSION	78 144 25	3
17		PIN, SPRING	99 143 97	2
18		NOT USED		
19		ROD, RELEASE	78 144 15	1
20		BLOCK, PIVOT/LATCH	78 142 01	1
21		PANEL, X RAY	78 140 01	1
22		SCREW, 10-32 x 5/16 TR, PH, SS	99 040 86	8
23		WASHER, NO. 10, LK, SHI, SS	99 123 92	10
24		WHEEL, PLASTIC	78 142 45	8
25		AXLE	78 142 50	8
26		BUTTON	78 147 70	2
27		SCREW, 8-32 x 3/8, OV, PH, SS	99 031 36	2
28		SUPPORT, MATTRESS	78 143 26	1
29		BUMPER, ELASTOMERIC	78 102 65	2
30		SCREW, 8-32 x 3/8, RD, PH, SS	99 031 37	8
31		WASHER, NO. 8, LK, SHI, SS	99 122 92	4
32		RELEASE PIN ASSY., (INCLUDES ITEMS 34, 35, 36, AND 37)	78 149 70	4
33		RING, RETAINING	99 182 67	4
34		RING, RETAINING	99 182 64	1
35		HOUSING, RELEASE PIN	78 149 00	1
36		SPRING, COMPRESSION	78 149 10	1
37		PIN, RELEASE	78 149 05	1
38		SHAFT, PIVOT	78 142 30	1
39		BLOCK, PIVOT	78 141 06	2
40		BUSHING, RELEASE	78 112 25	1
41		BRACKET	78 141 00	1
42		ROD, RELEASE	78 142 16	1
43		NOT USED		
44		TERM. SOLDER LUG	17 730 52	2
45		NOT USED		

TABLE 6.16 INTENSIVE CARE BASSINET, PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
46		SCREW, 8-32 x 3/8, FL, SL, SS	99 031 41	2
47		SPRING, COMPRESSION	78 142 40	2
48		BRACKET, ADJUST	78 141 11	2
49		WASHER, NO. 8, LK, SHI, SS	99 122 92	4
50		SCREW, 8-32 x 3/8, TR, PH, SS	99 031 38	4
51		SPRING, EXTENSION	78 142 20	2
52		NOT USED		
53		NOT USED		
54		NUT, 8-32 HX, KEPS, S, CA	99 106 32	4
55		WASHER, 1/4, LK, SHI, SS	99 125 54	2
56		SCREW, 1/4-20 x 3/8, RD, FL, SS	99 055 03	2
57		WIPER SPRING	78 142 55	2
58		SCREW, 4-40 x 1/4, TR, PH, SS	99 010 56	4
59		NUT, 4-40, HEX, "KEPS", S, CA	99 103 33	4

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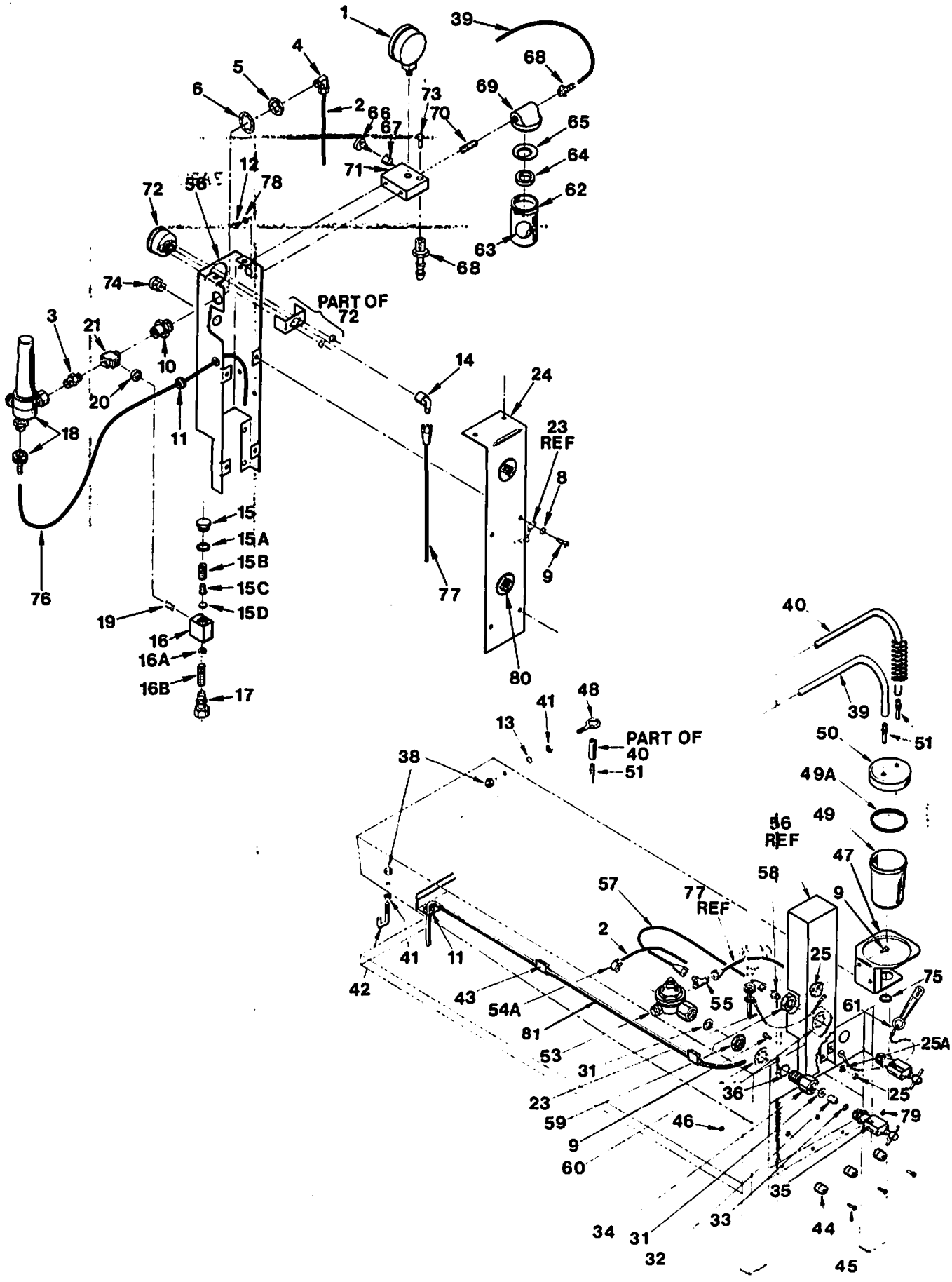

FIGURE 6.17 RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.17 RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 400 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.17				
1		GAUGE, SUCTION	08 010 00	1
2		TUBING, 1/4 COPPER	78 405 21	1
3		ADAPTOR	22 056 55	1
4		ELBOW, 1/4 x 1/8	78 425 05	1
5		NUT	78 423 05	1
6		WASHER, LOCK, 3/4	99 129 43	1
7		NOT USED		
8		WASHER, NO. 10, LK, SHI, SS	99 123 92	6
9		SCREW, NO. 10-32 x 3/8, TR, PH, SS	99 041 27	12
10		CONNECTOR, BUSHING	78 422 65	1
11		GROMMET	17 010 62	2
12		SCREW, 10-32 x 3/8, HX, SS	99 041 29	2
13		WASHER, NO. 6, LK, SHI, SS	99 122 19	2
14		ELBOW, 3/16 x 1/8	78 423 15	1
15		CHECK VALVE CAP	78 422 35	1
15A		"O" RING	99 160 76	1
15B		SPRING	78 422 55	1
15C		STEM	78 422 50	1
15D		DISC	78 422 45	1
16		CHECK VALVE BODY	78 422 40	1
16A		SCREEN	78 423 40	1
16B		SPRING	78 423 35	1
17		FITTING, DISS OXYGEN	78 411 00	1
18		FLOWMETER (0-10 LPM, BACK-PRESSURE COMPENSATED)	78 400 30	1
19		NIPPLE, CLOSE BRASS, 1/8	78 423 50	1
20		NOT USED		
21		STREET TEE, 1/8	01 023 01	1
22		NOT USED		
23		CHAIN ASSEMBLY, FLOWMETER	78 410 70	1
24		COVER, ACCESSORY, PANEL, MARKED	78 400 60	1
25		NUT, NO. 10-32, HX, KEPS, S, CAD	99 107 36	6
25A		WASHER	78 422 30	2
26		NOT USED		
27		NOT USED		
28		NOT USED		
29		NOT USED		
30		NOT USED		
31		WASHER, REGULATOR	78 423 30	3
32		CHECK VALVE	78 422 41	2
33		"O" RING	99 160 54	2
34		ADAPTER, YOKE	78 422 25	2
35		YOKE, MODIFIED, O_2	78 422 07	2
36		MOUNTING PLATE	78 201 48	1
37		NOT USED		
38		NUT ACORN NO. 5-40 ZINC	99 104 20	2
39		TUBING ASSEMBLY - GAGE	78 421 70	1

TABLE 6.17 RESUSCITATION/ASPIRATION ASSEMBLY PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
40		TUBING ASSY., ASPIRATOR	78 422 70	1
41		NUT, NO. 5-40, HX, SS	99 104 00	2
42		HOOK AMBU	78 100 30	1
43		CLIP (RICHCO KKC-6)	17 060 68	2
44		BUMPER	08 104 02	4
45		SCREW, NO. 4-40 x 3/4, RD, SL, SS	99 012 15	4
46		NUT, NO. 4-40, HX, KEPS, S, CAD	99 103 33	4
47		BRACKET, ASPIRATOR JAR	78 402 70	1
48		RETAINER (NOT USED WITH INTENSIVE CARE BASSINET)	78 410 65	1
49		JAR, ASPIRATOR	78 402 00	1
49A		"O" RING	99 163 02	1
50		CAP, JAR	78 400 66	1
51		NIPPLE, LONG	13 241 00	1
52		NOT USED		
53		REGULATOR, OXYGEN	78 410 45	1
54		BUSHING, 1/8F x 1/4M	17 014 60	1
54A		ELBOW, 1/4 x 1/4	78 425 15	1
55		TEE, 3/16 x 1/8	78 423 25	1
56		PANEL, MARKED	78 410 30	1
57		TUBING ASSEMBLY	78 425 70	1
58		CONNECTION, 3/16 x 1/8	78 423 20	1
59		NUT, YOKE ADAPTOR	78 422 20	2
60		WASHER, LOCK, 8/8	99 129 85	2
61		WRENCH ASSEMBLY	78 410 76	1
62		JAR, PRESSURE/VACUUM	08 200 00	1
63		TRAP, BALL	08 162 01	1
64		WASHER	26 524 00	1
65		GASKET, JAR	08 197 00	1
66		NEEDLE VALVE ASSEMBLY	08 610 70	1
67		NUT, SPLINE	08 601 31	1
68		HOSE, NIPPLE	01 017 00	1
69		CAP, JAR	08 196 01	1
70		NIPPLE, 1/8 NPT	08 011 02	1
71		BLOCK, VACUUM ADJUST	78 400 25	1
72		GAUGE, PRESSURE	78 422 00	1
73		VALVE, PRESSURE RELIEF	78 400 26	1
74		PLUG BUTTON	22 059 60	1
75		GROMMET	34 411 00	1
76		TUBE, AMBU	78 111 00	AR
77		TUBING ASSY.	78 425 71	1
78		WASHER, NO. 10, LK, SPS	99 123 90	2
79		WASHER	78 423 30	1
80		BUMPER	34 224 30	2
81		TUBING, CN DCT (120.00)	78 111 04	1

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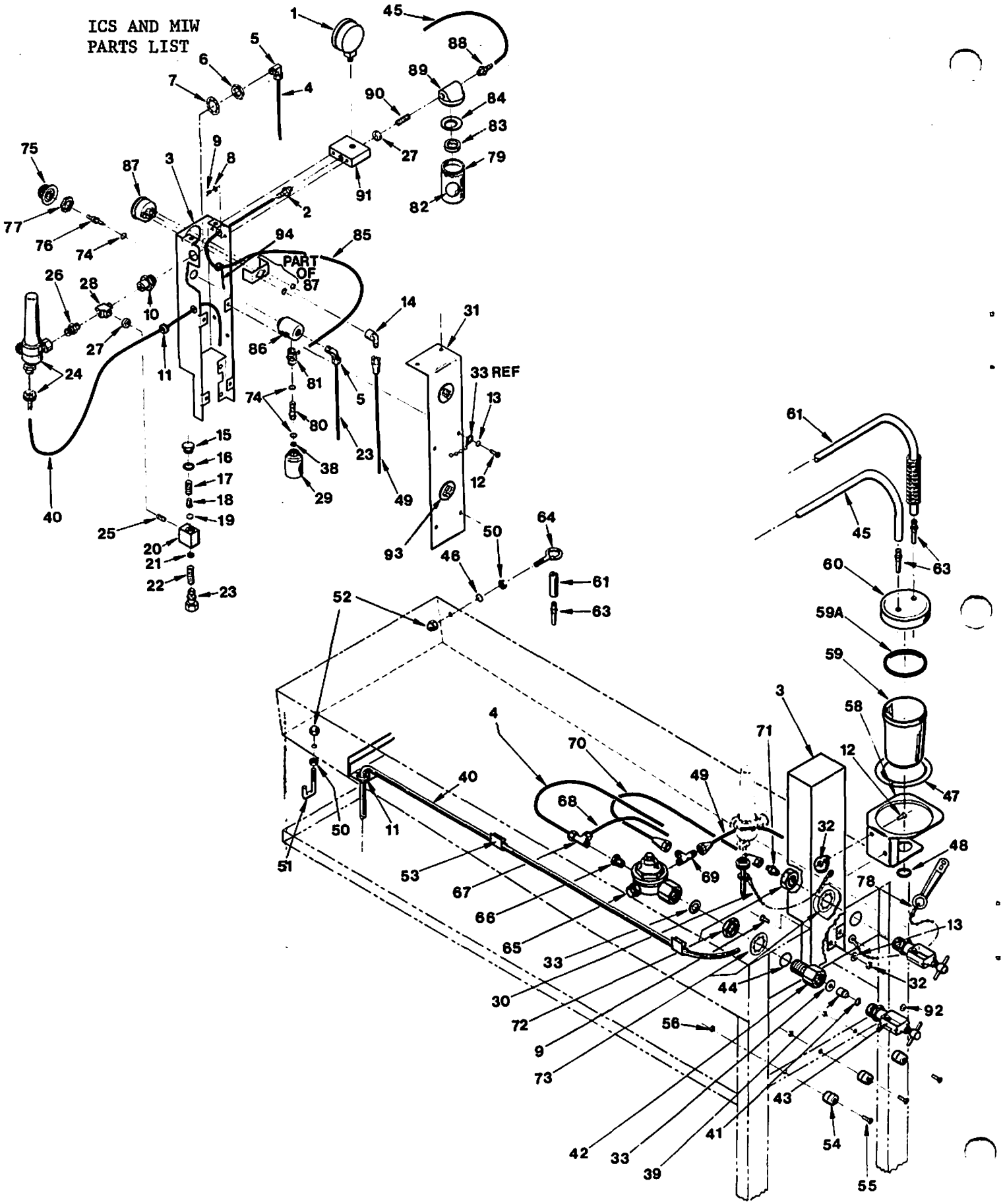

FIGURE 6.18 VENTURI RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.18, VENTURI RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LIST

(SHEET 1 OF 3) PART NO. 78 405 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.18				
1		GAUGE, SUCTION	08 010 00	1
2		CONNECTOR	09 903 00	1
3		PANEL, MARKED	78 410 30	1
4		TUBING, COPPER, 1/4 O.D.	78 405 20	1
5		ELBOW, 1/4 x 1/8	78 425 05	2
6		NUT	78 423 05	1
7		WASHER, 3/4 LK, SHI, S, CAD	99 129 43	1
8		WASHER, LK, NO. 10 SPS	99 123 90	2
9		SCREW, 10-32 x 3/8 HEX, SS	99 041 29	2
10		CONNECTOR, BUSHING	78 422 65	1
11		GROMMET	18 010 62	2
12		SCREW, 10-32 x 3/8 TR, PH, SS	99 041 27	12
13		WASHER, LK, NO. 10, SHI, SS	99 123 92	6
14		ELBOW, 3/16 x 1/8	78 423 15	1
15		CHECK VALVE CAP	78 422 35	1
16		"O" RING	99 160 76	1
17		SPRING	78 422 55	1
18		STEM	78 422 50	1
19		DISC	78 422 45	1
20		CHECK VALVE BODY	78 422 40	1
21		SCREEN	78 423 40	1
22		SPRING	78 423 35	1
23		FITTING, DISS OXYGEN (0-10 LPM, BACK-PRESSURE COMP)	78 411 00	1
24		FLOWMETER	78 400 30	1
25		NIPPLE, CLOSE BRASS, 1/8	78 423 50	1
26		ADAPTOR	22 056 55	1
27		NOT USED		
28		STREET TEE, 1/8	01 023 01	1
29		MICRO-FILTER ASSEMBLY	78 401 70	1
30		CHAIN ASSEMBLY FLOWMETER	78 410 70	1
31		COVER, MARKED	78 400 60	1
32		NUT, 10-32 HX, KEPS, S, CAD	99 107 36	6
33		WASHER, REGULATOR	78 422 30	2
34		NOT USED		
35		NOT USED		
36		NOT USED		
37		NOT USED		
38		COLLAR, VENTURI HOUSING	78 406 15	1
39		CHECK VALVE	78 422 41	2
40		TUBING, CNDCT (120.00)	78 111 04	1
41		"O" RING, 3/8 x 1/2 x 1/16 NEO	99 160 54	2
42		ADAPTER, YOKE	78 422 25	2
43		YOKE, MODIFIED, O_2	78 422 07	2
44		MOUNTING PLATE	78 201 48	1
45		TUBING ASSY., VALVE GAUGE	78 421 70	1

TABLE 6.18, VENTURI RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LIST (SHEET 2 OF 5)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
46		NOT USED		
47		NOT USED		
48		GROMMET	34 411 00	1
49		TUBING ASSEMBLY	78 425 71	1
50		NUT, HX, 5-40, SS	99 104 00	2
51		HOOK, AMBU	78 100 30	1
52		NUT, ACORN, 5-40, ZINC	99 104 20	1
53		CLIP (RICHCO KKC-6)	17 060 68	2
54		BUMPER	08 104 02	4
55		SCREW, 4-40 x 3/4, RD, SL, SS	99 012 15	4
56		NUT, HX, 4-40, KEPS, S, CAD	99 103 33	4
57		NOT USED		
58		BRACKET, ASPIRATOR JAR	78 402 70	1
59		JAR, ASPIRATOR	78 402 00	1
59A		"O" RING, 2-3/4 x 3 x 1/8	99 163 02	1
60		CAP, JAR	78 400 66	1
61		TUBING, ASSY., ASPIRATOR	78 422 70	1
62		NOT USED		
63		NIPPLE, LONG	17 241 00	2
64		NOT USED		
65		REGULATOR, OXYGEN	78 410 45	1
66		BUSHING, 1/8F x 1/4M	17 014 60	1
67		TEE, 1/4M-TUBE TO 1/8 NPT-M	78 425 10	1
68		TUBING, COPPER, 1/4 O.D.	78 405 21	1
69		TEE, 3/16 x 1/8	78 423 25	1
70		TUBING ASSEMBLY	78 425 70	1
71		CONNECTION, 3/16 x 1/8	78 423 20	1
72		NUT, YOKE ADAPTOR	78 422 20	2
73		WASHER, LOCK, 7/8	99 129 85	2
74		"O" RING, 1/16 x 1/4 I.D. x 3/8 O.D.	99 160 29	3
75		CONTROL KNOB	78 405 10	1
76*		STEM, NEEDLE VALVE	78 406 06	1
77		NUT, NEEDLE VALVE	78 405 01	1
78		CHAIN ASSEMBLY WRENCH	78 410 76	1
79		JAR	08 200 00	1
80		VENTURI	78 406 10	1
81		HOUSING ASSEMBLY	78 407 70	1
82		TRAP, BALL	08 162 01	1
83		WASHER	26 524 00	1
84		GASKET, JAR	08 197 00	1
85		TUBING, VENTURI ASPIRATOR	78 405 05	1
86		BODY, NEEDLE VALVE	78 406 00	1
87		GAUGE, PRESSURE	78 422 00	1
88		HOSE, NIPPLE	01 017 00	1
89		CAP, JAR	08 196 01	1
90		NIPPLE, 1/8 NPT	08 011 02	1

TABLE 6.18, VENTURI RESUSCITATION/ASPIRATION ASSEMBLY, PARTS LIST (SHEET 3 OF 3)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
91		BLOCK, VACUUM	78 408 00	1
92		WASHER	78 423 30	3
93		BUMPER	34 224 30	2
94		WIRE, CLEANING	78 406 20	1

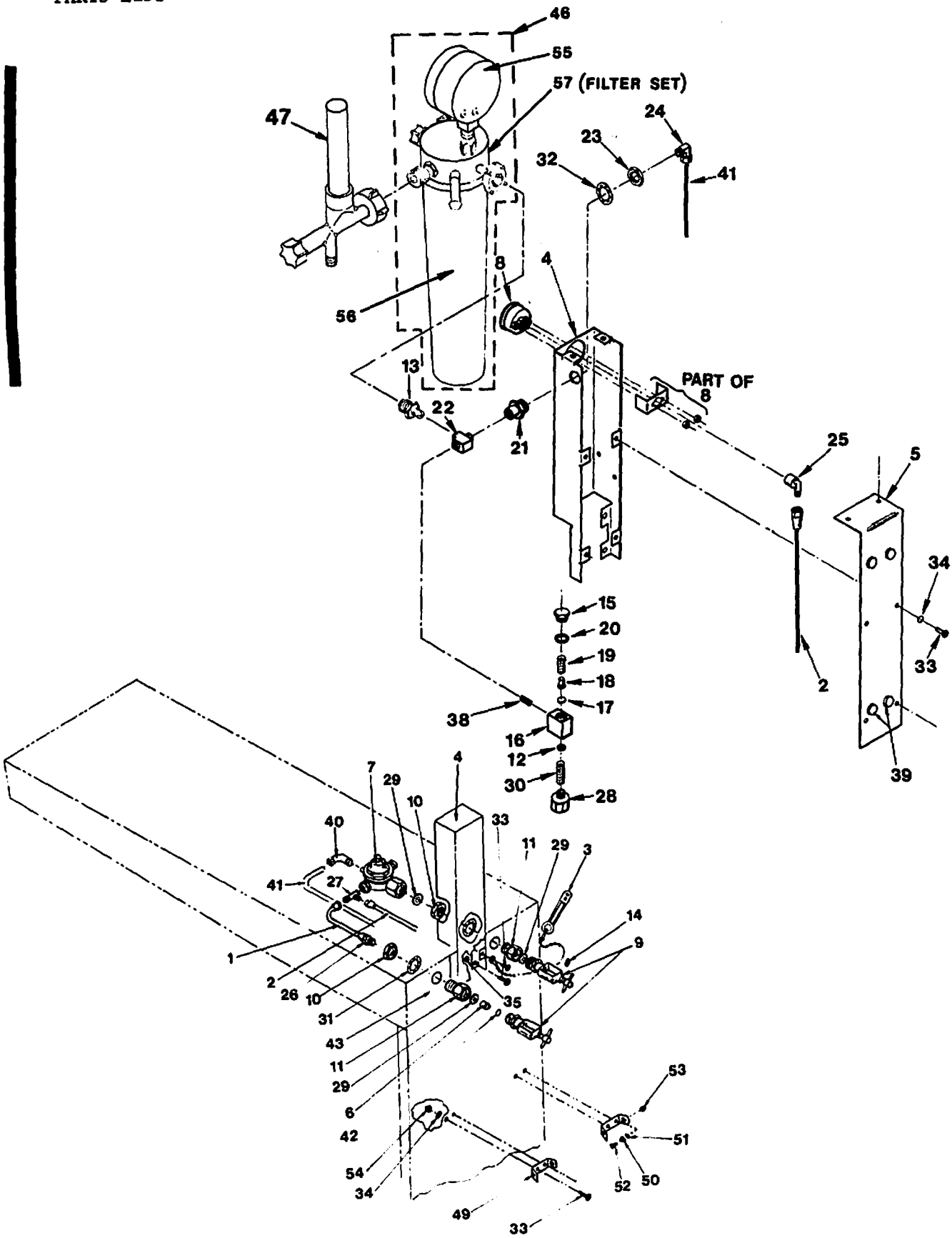

FIGURE 6.19 OXYGEN DELIVERY SYSTEM WITH TANK PROVISION, PARTS LOCATION DIAGRAM

TABLE 6.19 OXYGEN DELIVERY SYSTEM WITH TANK PROVISION, PARTS LIST (SHEET 1 OF 2)

PART NO. 78 400 81/82/83

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.19				
1		TUBING ASSEMBLY, 6" LONG	78 425 72	1
2		TUBING ASSEMBLY, 16" LONG	78 425 73	1
3		CHAIN ASSEMBLY, WRENCH	78 410 76	1
4		PANEL, ACCESSORY	78 400 07	1
5		COVER, ACCESSORY PANEL	78 400 10	1
6		CHECK VALVE	78 422 41	2
7		REGULATOR, OXYGEN	78 410 45	1
8		GAUGE, PRESSURE	78 422 00	1
9		YOKE, MODIFIED, OXYGEN	78 422 07	2
10		NUT, YOKE ADAPTOR	78 422 20	2
11		ADAPTOR, YOKE	78 422 25	2
12		SCREEN	78 423 40	4
13		ADAPTOR	22 056 55	1
14		WASHER	78 422 30	2
15		CHECK VALVE CAP	78 422 35	1
16		CHECK VALVE	78 422 40	1
17		DISC	78 422 45	1
18		STEM	78 422 50	1
19		SPRING	78 422 55	1
20		"O" RING, 1/2 x 11/16 x 3/32 RU8112	99 160 76	1
21		CONNECTOR, BUSHING	78 422 65	1
22		TEE, STREET, 1/8	01 023 01	1
23		NUT	78 423 05	1
24		ELBOW, 1/4 TUBE TO 1/8 MPT	78 525 05	1
25		ELBOW, 3/16 TUBE TO 1/8 FPT	78 423 15	1
26		CONNECTION, 3/16 TUBE TO 1/8 MPT	78 423 20	1
27		TEE, 3/16 TUBE TO 1/8 MPT	78 423 25	1
28		FITTING, DISS OXYGEN, FEMALE	78 411 00	1
29		WASHER, REGULATOR	78 423 30	3
30		SPRING	78 423 35	1
31		WASHER, 7/8 LK, SHI, S, CAD	99 129 85	3
32		WASHER, 3/4 LK, SHI, S, CAD	99 129 43	1
33		SCREW, 10-32 x 1/2 TR, PH, SS	99 042 01	14
34		WASHER, #10 LK, SHI, SS	99 123 92	10
35		NUT, 10-32 HX, KEPS, S, CAD	99 107 36	4
36		TAPE, FLOURD, JOINT SEAL	99 900 26	AR
37		NOT USED		
38		NIPPLE, CLOSE, 1/8 BRASS	78 423 50	1
39		BUMPER	34 224 30	4
40		ELBOW, 1/4 TUBE TO 1/4 MPT	78 425 15	1
41		TUBING, COPPER, 1/4 O.D.	78 405 22	1
42		"O" RING, 3/8 x 1/2 x 1/16 NEO	99 160 54	2
43		PLATE	78 112 10	1
44		NOT USED		
45		NOT USED		
46		TWIN-O-VAC* (ADULT)	78 404 00	1
47		TWIN-O-VAC** (PEDIATRIC)	78 404 20	1
		FLOWMETER*	78 400 30	1

*78 400 82 only
**78 400 83 only

TABLE 6.19 OXYGEN DELIVERY SYSTEM WITH TANK PROVISION, PARTS LIST (SHEET 2 OF 2)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
48		NOT USED		
49		BRACKET, TANK SUPPORT	78 112 35	2
50		DOOR STOP	26 605 00	4
51		BUMPER SPACER	26 651 15	4
52		SCREW, 6-32 x 9/16 RD, HD, SS	99 024 15	4
53		NUT, 6-32 HX ACAL	99 105 20	4
54		NUT, 10-32 HX ACAL	99 107 20	4
55		VACUUM GAGE* (ADULT)	78 404 05	1
		VACUUM GAGE** (PEDIATRIC)	78 404 25	1
56		JAR	78 404 10	1
57		FILTER SET (PKG. OF 100)	78 404 15	1

*78 400 82 only
**78 400 83 only

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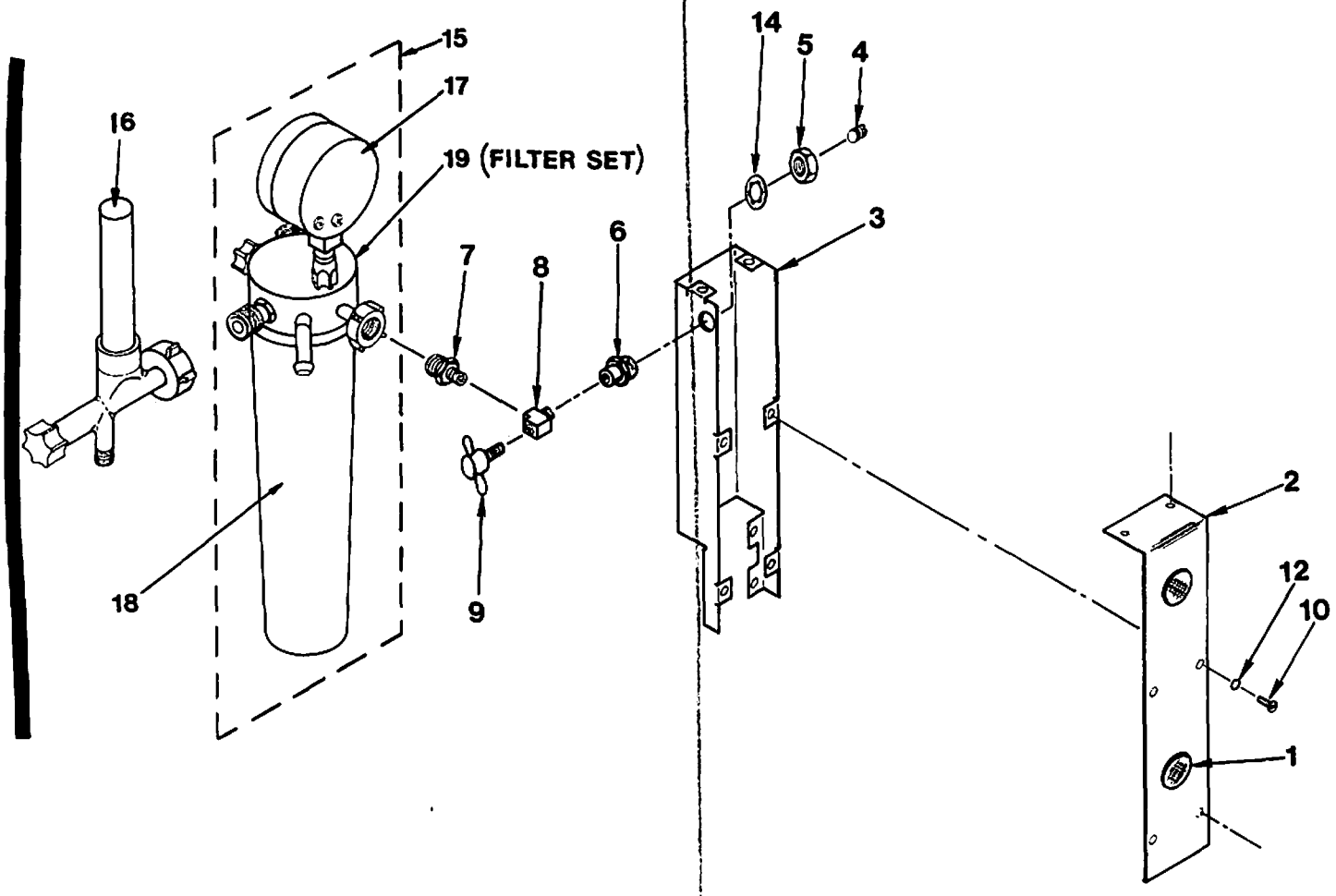

FIGURE 6.20 OXYGEN DELIVERY SYSTEM WITHOUT TANK PROVISION, PARTS LOCATION DIAGRAM

TABLE 6.20 OXYGEN DELIVERY SYSTEM WITHOUT TANK PROVISION, PARTS LIST

PART NO. 78 400 80

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.20				
1		BUMPER	34 224 30	4
2		COVER, ACCESSORY PANEL	78 400 10	1
3		PANEL, ACCESSORY	78 400 06	1
4		PLUG, 1/8 PIPE	45 203 50	1
5		NUT	78 423 05	1
6		CONNECTOR, BUSHING	78 422 65	1
7		ADAPTOR	22 056 55	1
8		STREET TEE, 1/8	01 023 01	1
9		FITTING, DISS, OXYGEN FEMALE	78 411 32	1
10		SCREW, 10-32 x 3/8, TR, PH, SS	99 041 27	10
11		NUT, 10-32, KEPS, S, CAD	99 107 36	4
12		WASHER, #10 LK, SHI, SS	99 123 92	6
13		FLOUROTAPE, JOINT SEAL	99 900 26	AR
14		WASHER, 3/4, LK, SHI, S, CAD	99 129 43	1
15		TWIN-O-VAC* (ADULT)	78 404 00	1
		TWIN-O-VAC* (PEDIATRIC)	78 404 25	1
16		FLOWMETER*	78 400 30	1
17		VACUUM GAGE (ADULT)	78 404 05	1
18		JAR	78 404 10	1
19		FILTER SET (PKG. OF 100)	78 404 15	1
		*ACCESSORIES		

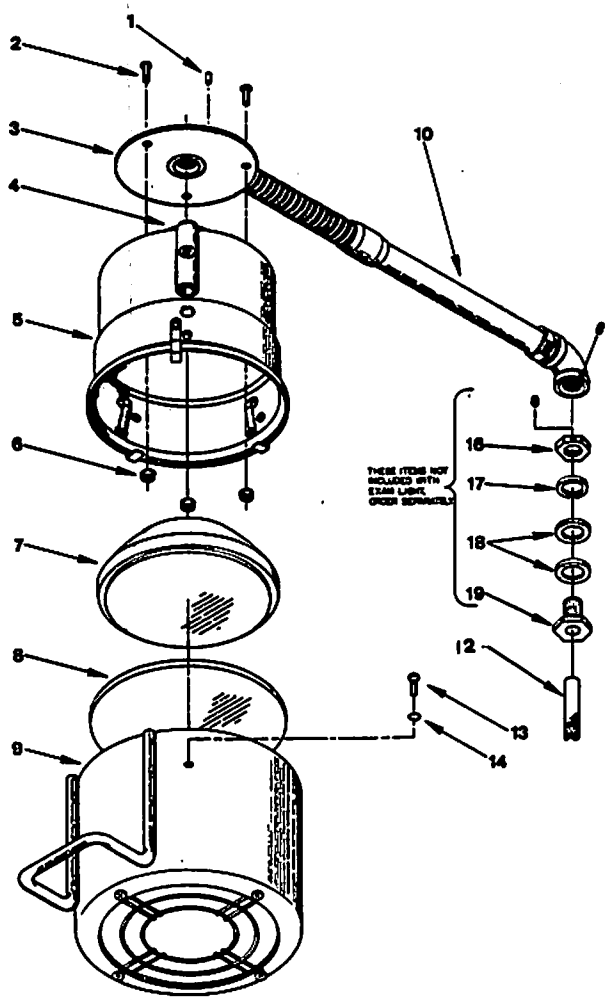

FIGURE 6.21 EXAMINATION LIGHT (FLEXIBLE EXTENSION), PARTS LOCATION DIAGRAM

TABLE 6.21 EXAMINATION LIGHT (FLEXIBLE EXTENSION), PARTS LIST

PART NO. 78 240 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.21				
1		SCREW SET, 6-32 x 3/16 SK, SS, CU	99 022 41	3
2		SCREW, #10-32 x 1/2, TR, PH, SS	99 042 01	3
3		PLATE, MOUNTING	78 244 10	1
4		GROMMET	00 139 00	1
5		HOUSING ASSEMBLY	78 242 70	1
6		NUT, HX, KEPS, 10-32, CAD PL	99 107 36	3
7		LIGHT, EXAMINATION	78 240 00	1
8		FILTER	78 240 10	1
9		COVER ASSEMBLY	78 241 70	1
10		EXTENSION PIPE ASSEMBLY	78 243 70	1
11		NOT USED		
12		SLEEVING, FIBERGLASS NO. 6, 20" LG	17 726 67	1
13		SCREW, 8 x 32 x 3/8, TR, PH, SS	99 031 38	3
14		WASHER, LK #8, SHI, SS	99 122 92	3
15		NOT USED		
16		COLLAR, EXAMINATION LIGHT	78 243 20	1
17		WASHER, SPRING	99 127 67	1
18		WASHER, FL, NY 1/2	99 127 66	2
19		NUT, EXAMINATION LIGHT	78 240 30	1

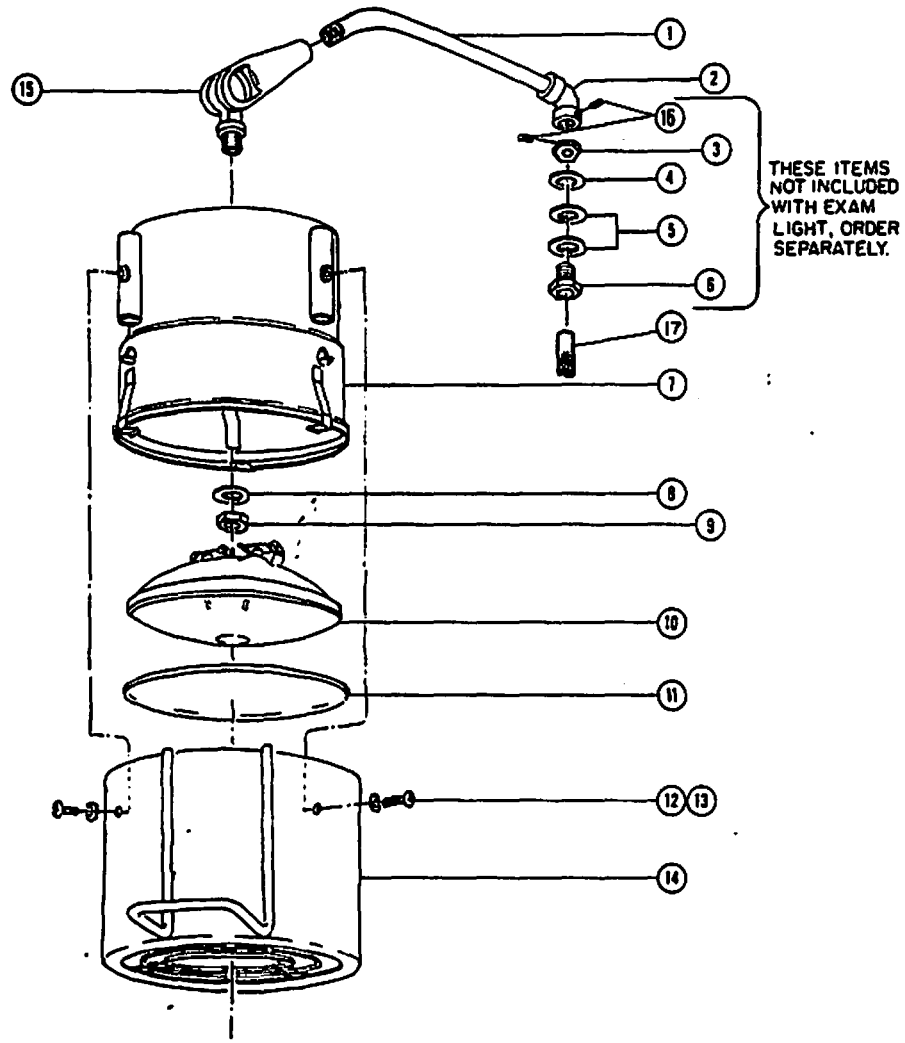

FIGURE 6.22 EXAMINATION LIGHT (WITH RIGID EXTENSION), PARTS LOCATION DIAGRAM

TABLE 6.22 EXAMINATION LIGHT (WITH RIGID EXTENSION), PARTS LIST

PART NO. 78 240 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.22				
1*		EXTENSION PIPE	78 243 00	-
2*		ELBOW	78 243 06	1
3		COLLAR	78 243 20	1
4		WASHER, SPRING	99 127 67	1
5		WASHER, FL, NY, 1/2	99 127 66	2
6		NUT, EXAMINATION LAMP	78 240 30	1
7**		HOUSING ASSEMBLY	78 242 70	1
8		WASHER, LOCK, 3/8 SHI S CA	99 126 93	1
9		NUT, EXAMINATION LAMP	78 240 20	1
10		LAMP, EXAMINATION	78 240 00	1
11		FILTER	78 240 10	1
12		SCREW, NO. 8-32 x 3/8, TR, PH, SS	99 031 38	3
13		WASHER, LOCK NO. 8 SHI, SS	99 122 92	3
14		COVER ASSEMBLY	78 241 70	1
15*		SWIVEL	78 240 15	1
16		SET SCREW NO. 6-32 x 3/16	99 022 41	2
17		SLEEVING, FIBERGLASS, NO. 6, 20"	17 726 67	1

*THIS PART IS NO LONGER AVAILABLE. IF REPLACEMENT IS NECESSARY, ORDER RETROFIT KIT, PART NO. 78 908 70, WHICH PROVIDES PARTS TO CONVERT TO A NEW TYPE FLEXIBLE EXTENSION.

**IT IS RECOMMENDED THAT IF THIS PART IS BEING REPLACED THAT RETROFIT KIT, PART NO. 78 908 70 ALSO BE ORDERED. THIS KIT PROVIDES PARTS TO CONVERT TO A NEW TYPE FLEXIBLE EXTENSION.

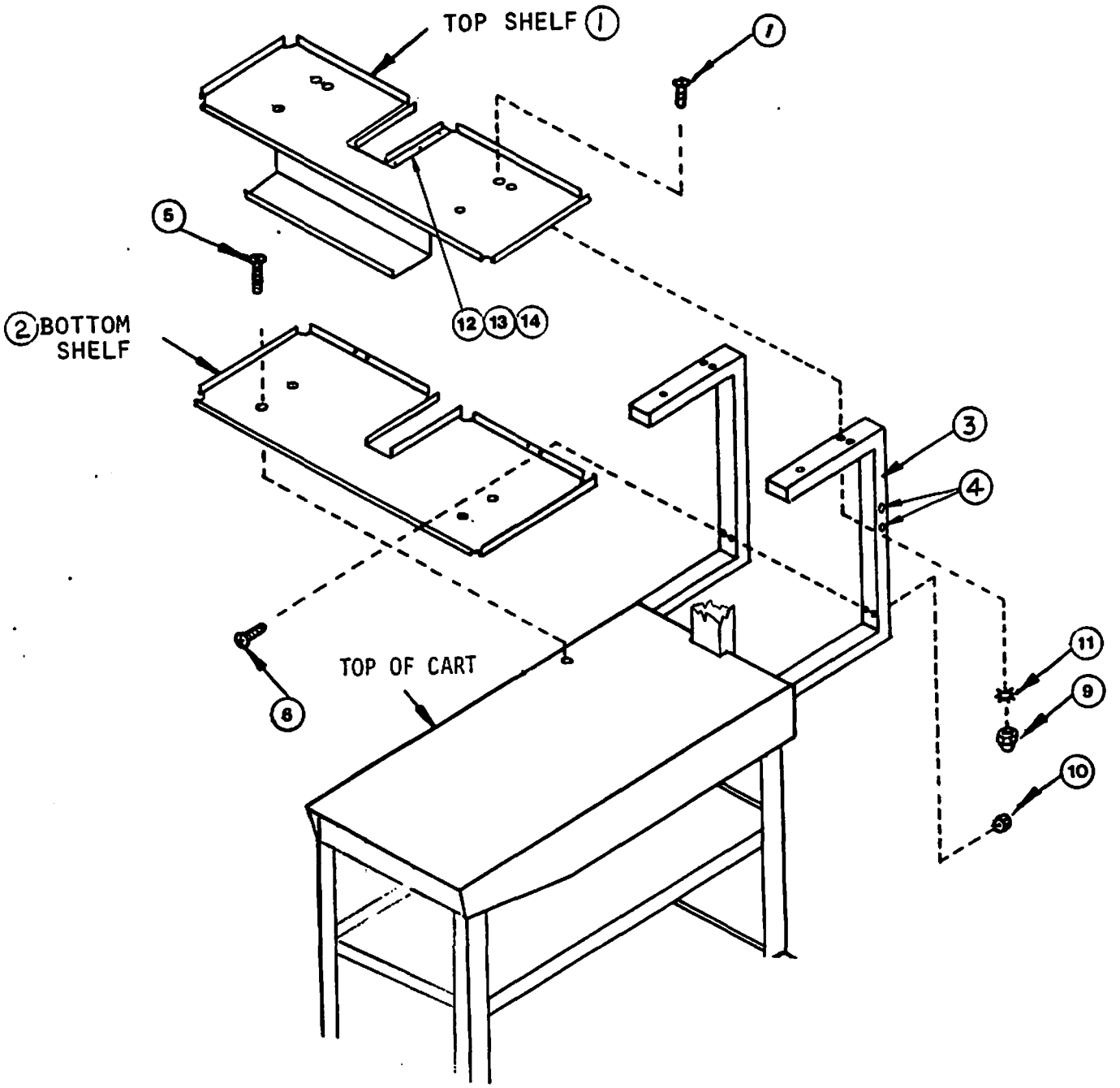

FIGURE 6.23 MONITOR SHELF ASSEMBLY (SINGLE OR DOUBLE TIER)
PARTS LOCATION DIAGRAM (STANDARD AND INTENSIVE CARE CARTS)

TABLE 6.23 MONITOR SHELF ASSEMBLY (SINGLE OR DOUBLE TIER), STANDARD AND INTENSIVE CARE CARTS, PARTS LIST

SINGLE TIER ASSEMBLY PART NO. 78 115 70/75
DOUBLE TIER ASSEMBLY PART NO. 78 125 70/75

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.23				
1		UPPER MONITOR SHELF	78 116 70	1
2		SHELF MONITOR LOWER	78 125 01	1
3		SUPPORT, DOUBLE TIER SHELF	78 125 05	2
4		PLUG BUTTON	53 101 28	8
5		SCREW 10-32 x 5/16 FL, PH, SS	99 040 87	2
6		SCREW 10-32 x 3/8 TR, PH, SS	99 041 27	4
7		SCREW 10-32 x 1-3/8 FL, SL, SS	99 044 21	6
8		SCREW, 3/8-16 x 2-3/4 CARRIAGE SCA	99 068 33	2
9		NUT 10-32 ACORN, AL	99 107 20	6
10		NUT 10-32 HX "KEPS" SCA	99 107 36	4
11		WASHER 10 LK, SHE, SS	99 123 94	6
12		GUIDE STRIP	78 115 15	2
13		SCREW 6-32 x 1/4 FL, PH, SS	99 022 77	6
14		NUT 6-32 HX "KEPS" SCA	99 105 34	6
15		WASHER, 3/8 LK, SPS, CA, LIGHT	99 126 92	2
16		PLUG BUTTON	78 115 10	4

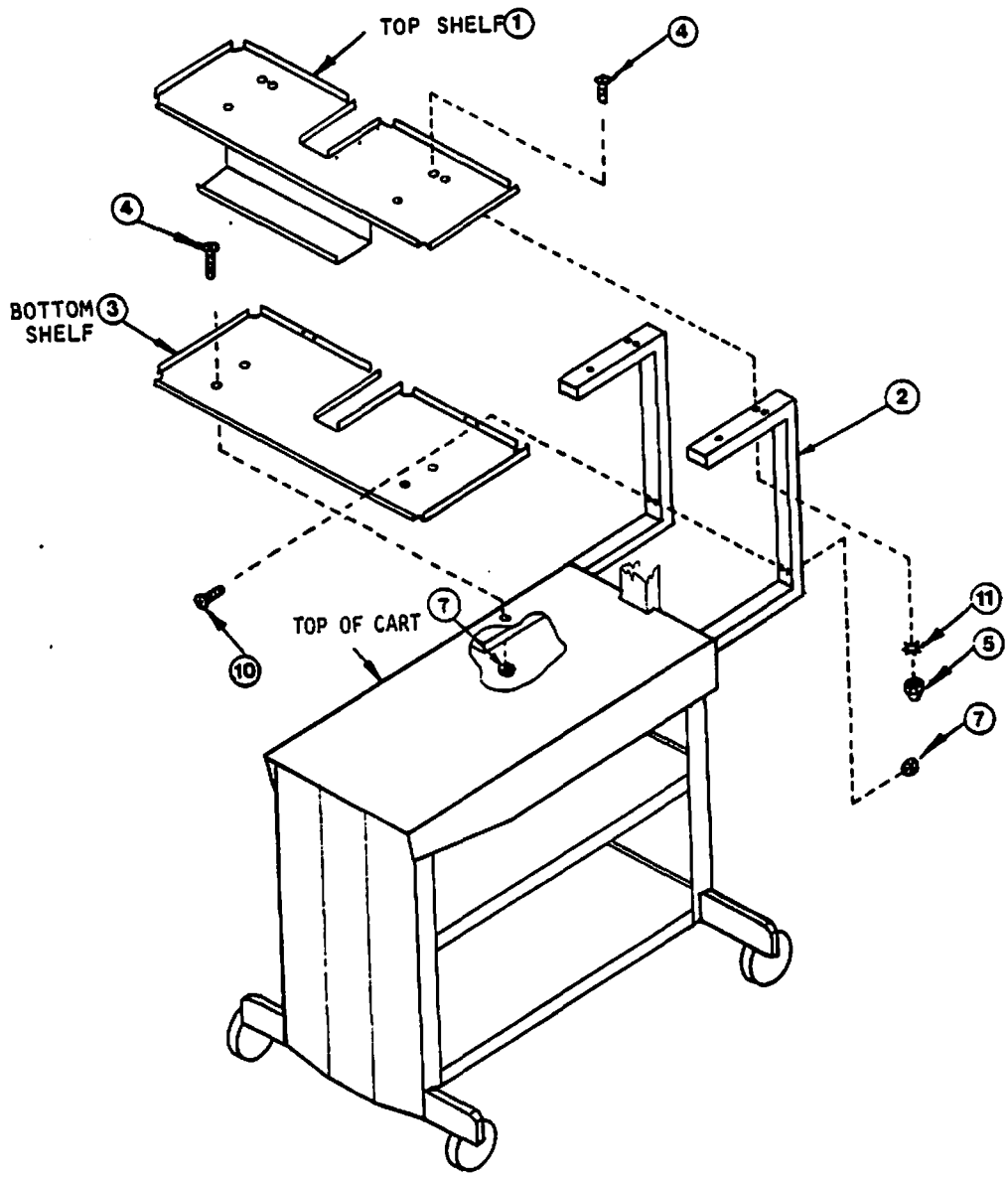

FIGURE 6.24 MONITOR SHELF ASSEMBLY (SINGLE OR DOUBLE TIER)
BASIC WELD CART PARTS LOCATION DIAGRAM

TABLE 6.24 MONITOR SHELF ASSEMBLY (SINGLE OR DOUBLE TIER)

BASIC WELD CART, PARTS LIST

SINGLE TIER ASSEMBLY PART NO. 78 914 80
DOUBLE TIER ASSEMBLY PART NO. 78 914 81

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY. PER ASSY.
Fig. 6.24				
1		UPPER MONITOR SHELF	78 116 70	1
2		SUPPORT, REAR, SHELF	78 112 20	2
3		SHELF, LOWER	78 125 02	1
4		SCREW, 10-32 x 1-3/8 FL, PH SS	99 044 22	10
5		NUT, 10-32, ACORN, AL	99 107 20	6
6		PLUG BUTTON (FOR 1/4 HOLE)	78 101 28	4
7		NUT, 10-32, HX KEPS, S, CA	99 107 36	10
8		SCREW, 10-32 x 1-3/8, TR, PH, SS	99 044 19	2
9		PLUG BUTTON (FOR 9/32 HOLES)	53 101 28	8
10		SCREW, 10-32 x 3/8, TR, PH, SS	99 041 27	4
11		WASHER, #10 LK, SHE, SS	99 123 94	6

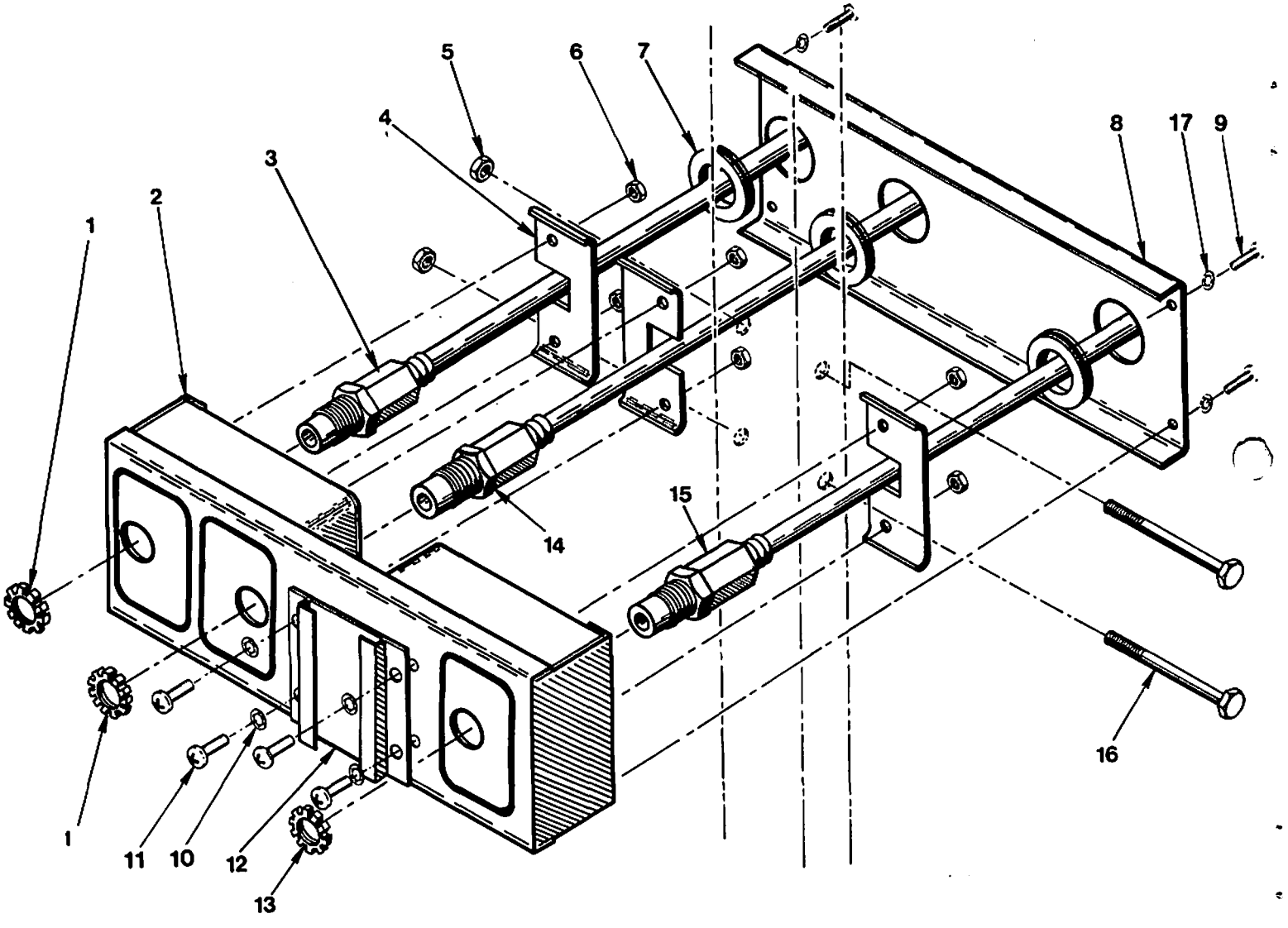

FIGURE 6.25 GAS DELIVERY PANEL, PARTS LOCATION DIAGRAM
(ONE PIECE HOSE ASSEMBLIES)

TABLE 6.25 GAS DELIVERY PANEL, PARTS LIST (SHEET 1 OF 2)

(ONE PIECE HOSE ASSEMBLIES)

PART NO. 78 430 70 through 73
PART NO. 78 430 80 through 83

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.25				
1		LOCKNUT	78 435 50	2
2		PANEL, MARKED	78 430 15	1
3		SUCTION HOSE ASSY. (W/O INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 70	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 70	1
		SUCTION HOSE ASSY (W/O INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 73	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 73	1
		SUCTION HOSE ASSY. (W/INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 70	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 70	1
		SUCTION HOSE ASSY. (W/INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS. DEL. PANEL	78 436 73	1
		UNITS WITH 2 GAS. DEL. PANELS	78 438 73	1
4		BRACKET, MOUNTING	78 430 20	3
5		NUT 1/4-20, KEPS, HX, S, CA	99 109 41	2
6		NUT 8-32, KEPS, HX, S, CA	99 106 32	6
7		GROMMET	78 430 30	3
8		COVER, REAR	78 430 25	1
9		SCREW 6-32 x 3/8 LG, RD, PH, SS	99 023 26	4
10		WASHER, 10 LK, SHI, SS	99 123 92	4
11		SCREW 10-32 x 3/8 LG, PN, PH, SS	99 041 30	4
12		BRACKET ASSY, OXYGEN BLENDER	78 431 70	1
13		LOCKNUT	78 435 55	1
14		AIR HOSE ASSY. (W/O INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 71	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 71	1
		AIR HOSE ASSY. (W/O INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 74	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 74	1
		AIR HOSE ASSY. (W/INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 71	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 71	1
		AIR HOSE ASSY. (W/INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 74	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 74	1

TABLE 6.25 GAS DELIVERY PANEL, PARTS LIST (SHEET 2 OF 2)

(ONE PIECE HOSE ASSEMBLIES)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
15		OXYGEN HOSE ASSY. (W/O INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 72	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 72	1
		OXYGEN HOSE ASSY. (W/O INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 75	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 75	1
		OXYGEN HOSE ASSY. (W/INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 72	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 72	1
		OXYGEN HOSE ASSY. (W/INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 75	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 75	1
16		SCR, 1/4-20 x 2-1/2 LG, HX, S, CA	99 060 11	2
17		WSHR, NO. 6, LK, SHI, SS	99 122 19	4

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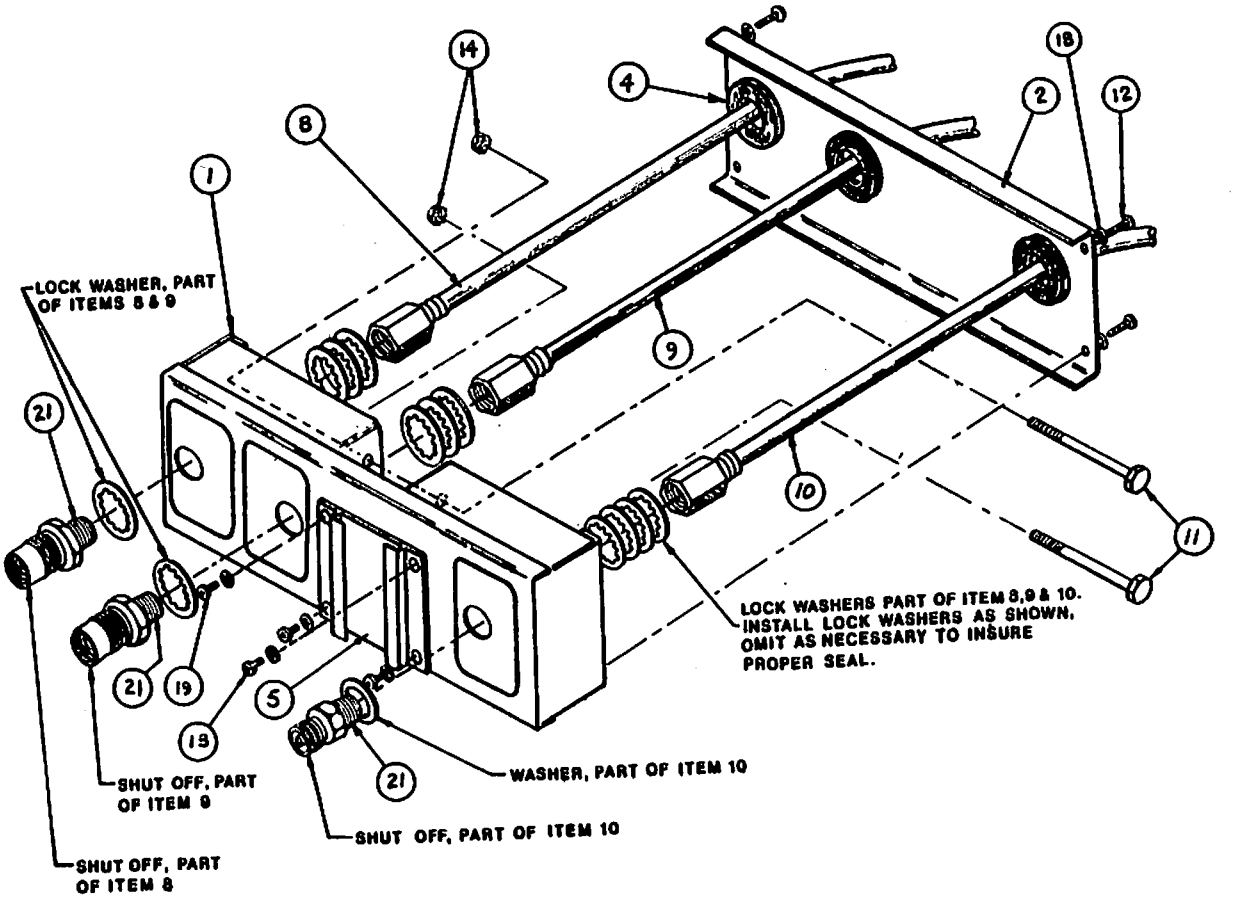
LOCK WASHER, PART OF ITEMS 8 & 9
LOCK WASHERS PART OF ITEM 8,9 & 10. INSTALL LOCK WASHERS AS SHOWN, OMIT AS NECESSARY TO INSURE PROPER SEAL.
WASHER, PART OF ITEM 10
SHUT OFF, PART OF ITEM 9
SHUT OFF, PART OF ITEM 10
SHUT OFF, PART OF ITEM 8

FIGURE 6.26 GAS DELIVERY PANEL, PARTS LOCATION DIAGRAM
(TWO PIECE HOSE ASSEMBLIES)

TABLE 6.26 GAS DELIVERY PANEL, PARTS LIST (SHEET 1 OF 2)
(TWO PIECE HOSE ASSEMBLIES)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY. PER ASSY.
Fig. 6.26				
1		PANEL, MARKED	78 430 15	1
2		COVER, REAR	78 430 25	1
3		NOT USED		
4		GROMMET	78 430 30	3
5		BRACKET, MOUNTING, O_2 BLENDER	78 431 70	1
6		NOT USED		
7		NOT USED		
8		SUCTION HOSE ASSY. (W/O INLET FITTINGS) 5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 70	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 70	1
		SUCTION HOSE ASSY. (W/O INLET FITTINGS) 10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 73	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 73	1
		SUCTION HOSE ASSY. (W/INLET FITTINGS) 5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 70	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 70	1
		SUCTION HOSE ASSY. (W/INLET FITTINGS) 10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 73	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 73	1
9		AIR HOSE ASSY. (W/O INLET FITTINGS) 5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 71	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 71	1
		AIR HOSE ASSY. (W/O INLET FITTINGS) 10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 74	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 74	1
		AIR HOSE ASSY. (W/INLET FITTINGS) 5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 71	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 71	1
		AIR HOSE ASSY. (W/INLET FITTINGS) 10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 74	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 74	1

TABLE 6.26 GAS DELIVERY PANEL, PARTS LIST (SHEET 2 OF 2)
(TWO PIECE HOSE ASSEMBLIES)

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY. PER ASSY.
10		OXYGEN HOSE ASSY. (W/O INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 72	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 72	1
		OXYGEN HOSE ASSY. (W/O INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 435 75	1
		UNITS WITH 2 GAS DEL. PANELS	78 437 75	1
		OXYGEN HOSE ASSY. (W/INLET FITTINGS)		
		5 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 72	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 72	1
		OXYGEN HOSE ASSY. (W/INLET FITTINGS)		
		10 FOOT LONG		
		UNITS WITH 1 GAS DEL. PANEL	78 436 75	1
		UNITS WITH 2 GAS DEL. PANELS	78 438 75	1
11		SCR, 1/4-20 x 2-1/2 LG, HX, S, CA	99 060 11	2
12		SCR, 6-32 x 3/8 LG, RD, PH, SS	99 023 26	4
13		SCR, 10-32 x 3/8 LG, PN, PH, SS	99 041 30	4
14		NUT, 1/4-20, KEPS, HX, S, CA	99 109 41	2
15		NOT USED		
16		NOT USED		
17		NOT USED		
18		WSHR, NO. 6, LK SHI SS	99 122 19	4
19		WSHR, NO. 10, LK SHI SS	99 123 92	4
20		NOT USED		
21		TAPE, TEFLON, PIPE	99 900 26	A/R

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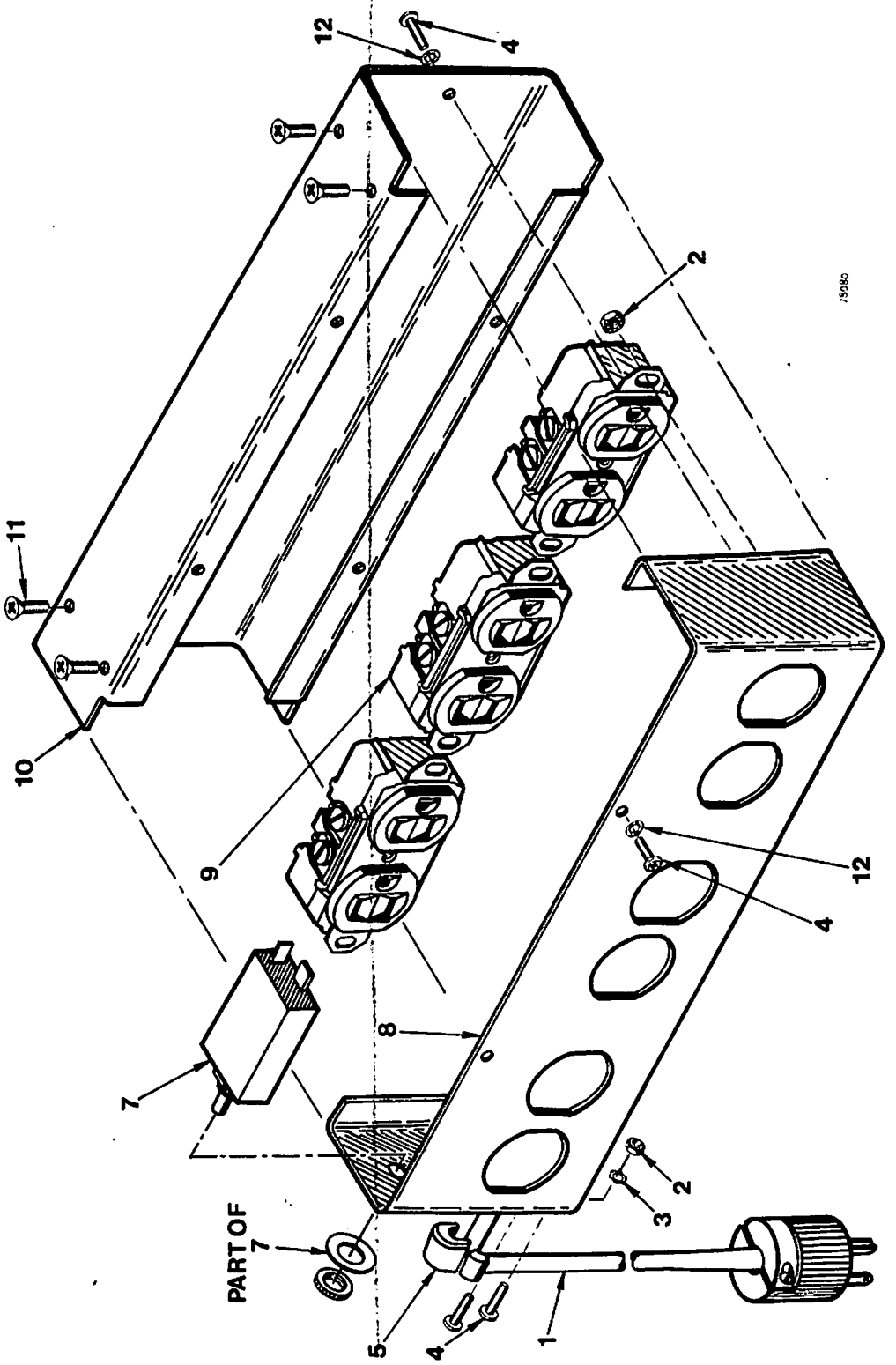

FIGURE 6.27 AC RECEPTACLE BOX, PARTS LOCATION DIAGRAM

TABLE 6.27, AC RECEPTACLE BOX, PARTS LIST

PART NO. 78 910 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.25				
1		CABLE ASSY, AC POWER CORD	17 728 75	1
2		NUT 6-32 HX "KEPS" S CA	99 105 34	8
3		WASHER NO. 6 LK SHE SS	99 122 20	2
4		SCREW 6-32 x 3/8 TR PH SS	99 023 31	6
5		STRAIN RELIEF	08 182 00	1
6		NOT USED		
7		CIRCUIT BREAKER	17 727 64	1
8		PANEL, MARKED	78 910 25	1
9		RECEPTACLE, DUPLEX	17 727 63	3
10		COVER, RECEPTACLE PANEL	78 910 10	1
11		SCREW 6-32 x 5/16 FL PH SS (100° HD)	99 023 01	4
12		WASHER NO. 6 LK SHI SS	99 122 19	6

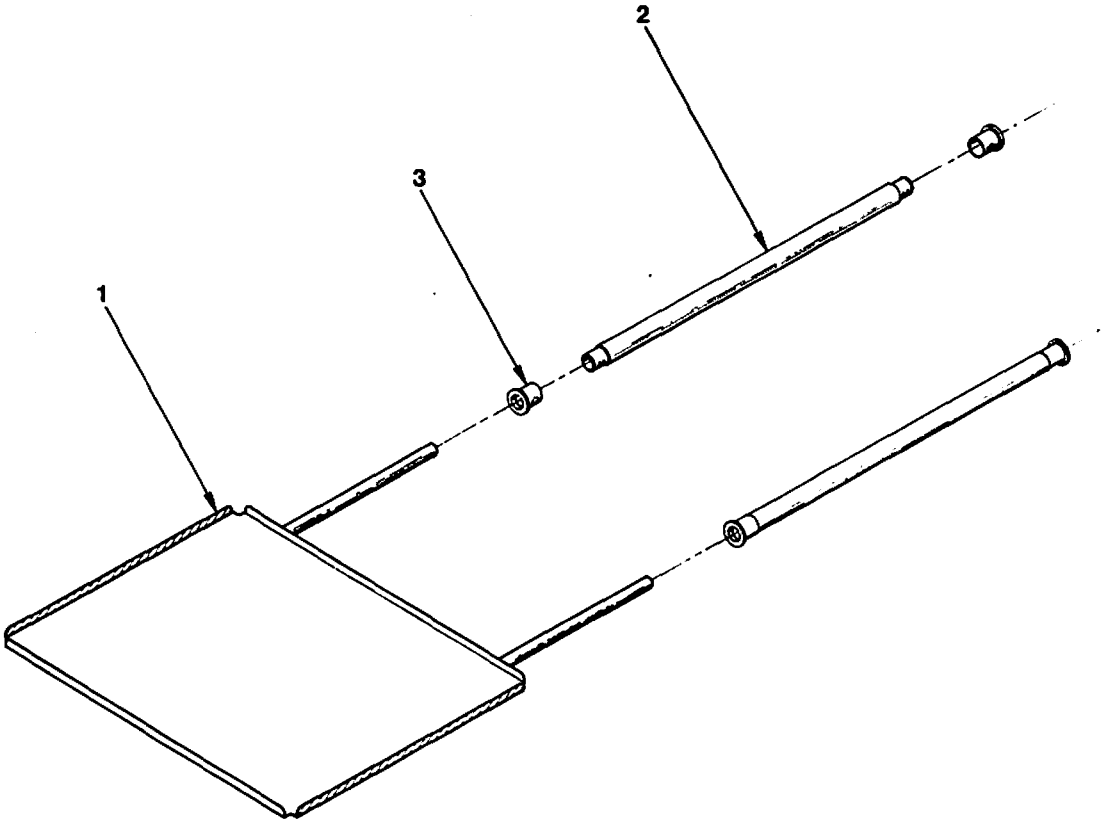

FIGURE 6.28 INSTRUMENT TRAY (FOR USE WITH STANDARD BASSINETS), PARTS LOCATION DIAGRAM

TABLE 6.28 INSTRUMENT TRAY (FOR USE WITH STANDARD BASSINET), PARTS LIST

PART NO. 78 105 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.26				
1		INSTRUMENT TRAY	78 101 60	1
2		TUBING	78 102 55	2
3		BUSHING	78 102 50	4

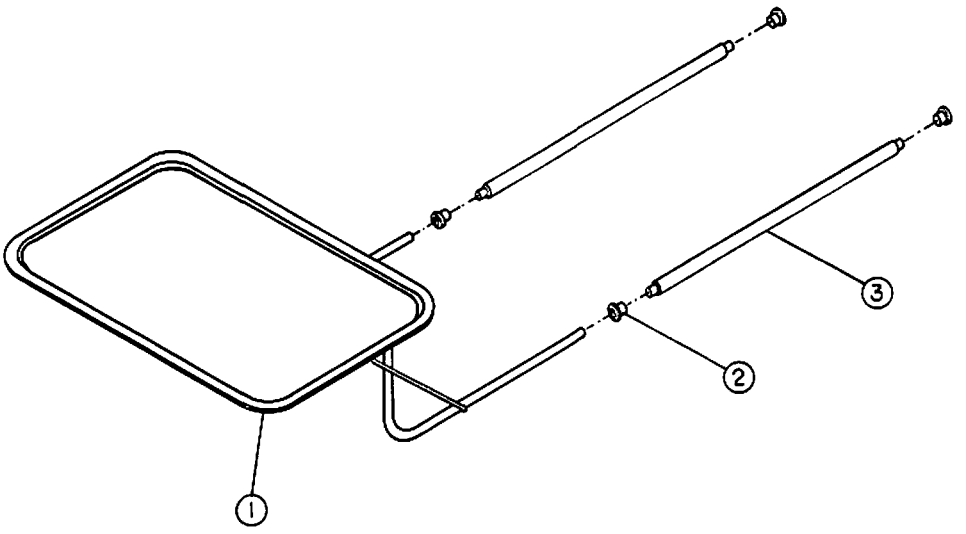

FIGURE 6.29 INSTRUMENT TRAY (FOR USE WITH INTENSIVE CARE BASSINETS), PARTS LOCATION DIAGRAM

TABLE 6.29, INSTRUMENT TRAY (FOR USE WITH INTENSIVE CARE BASSINETS), PARTS LIST

PART NO. 78 105 80

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.27				
1		INSTRUMENT TRAY	78 105 00	1
2		BUSHING	78 102 50	4
3		TUBING	78 102 55	2

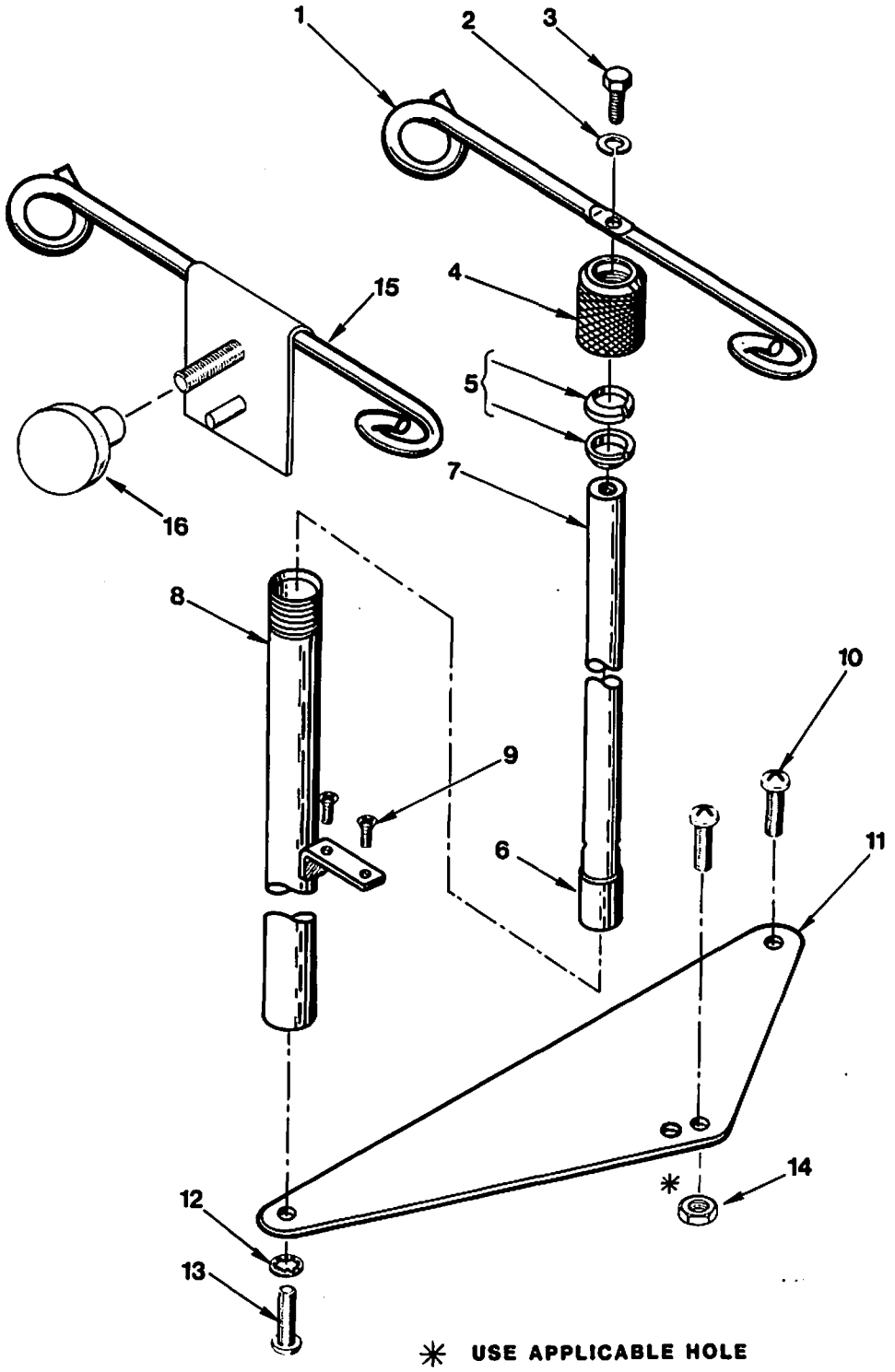

FIGURE 6.30 I.V. TREE AND POLE ASSEMBLY, PARTS LOCATION DIAGRAM

TABLE 6.30 I.V. TREE AND POLE ASSEMBLY, PARTS LIST

SINGLE TIER SHELF PART NO. 78 109 70
DOUBLE TIER SHELF PART NO. 78 109 71
I.V. TREE ASSEMBLY PART NO. 78 906 70

ITEM NO.	REFERENCE DESIGNATION	DESCRIPTION	PART NO.	QTY PER ASSY.
Fig. 6.28				
1		CROSS ARM	26 822 00	1
2		WASHER 5/16 LK, SP, S, CA	99 126 32	1
3		SCREW 5/16-18 x 1/2 HX S CA	99 064 21	1
4		NUT, LOCKING	26 821 00	1
5		COLLAR, COMPRESSION	31 102 50	1
6		BUSHING, GUIDE	26 827 05	1
7		EXTENSION ASSEMBLY I.V. POLE	78 108 70	1
8		HOLDER I.V. POLE	78 109 00	1
9		SCREW 6-32 x 1/4 FL PH SS (100° HD)	99 022 77	2
10		NOT USED		
11		SUPPORT I.V. POLE*	99 109 20	
12		WASHER NO. 10 LK SHE SS	99 123 94	1
13		SCREW 10-32 x 3/8 TR PH SS*	99 041 27	2
14		NUT 10-32 HX "KEPS" S CA*	99 107 36	1
15		I.V. CROSS ARM**	78 204 00	1
16		KNOB**	17 061 01	1

*SUPPORT, NUT, AND ONE SCREW FOR USE WITH WITH SINGLE TIER SHELF.

**IV TREE ASSEMBLY.

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SECTION 7
DIAGRAMS

7.1 GENERAL

This section provides block, schematic, and wiring diagrams for the Manual Controller, Servo Controller Models SC78-1 and SC78-2, and Warmer Module.

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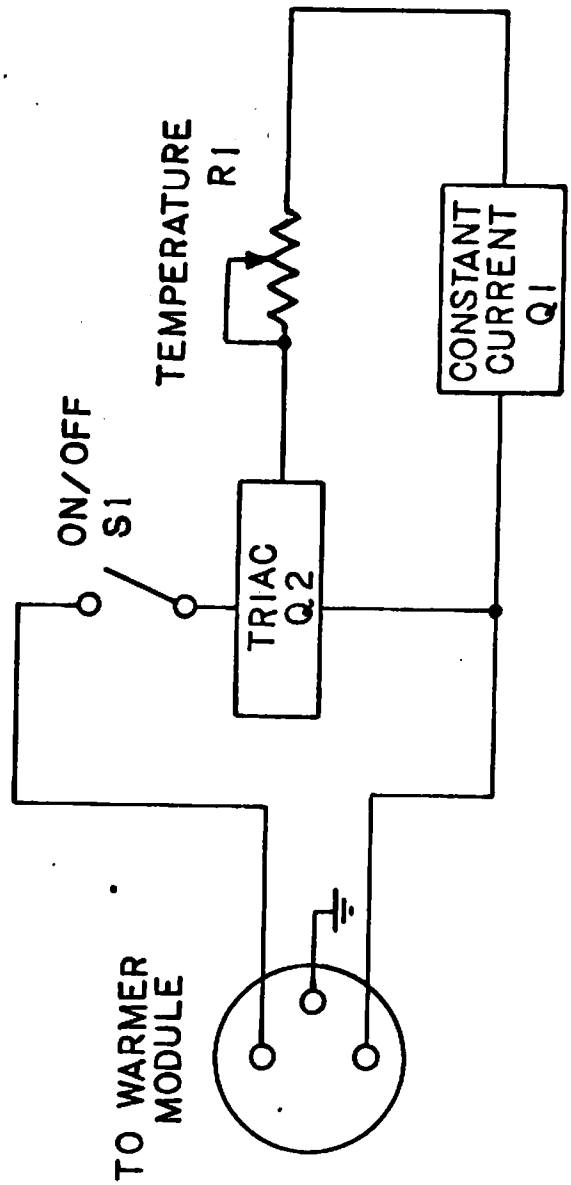

FIGURE 7.1 FUNCTIONAL BLOCK DIAGRAM, MANUAL CONTROLLER

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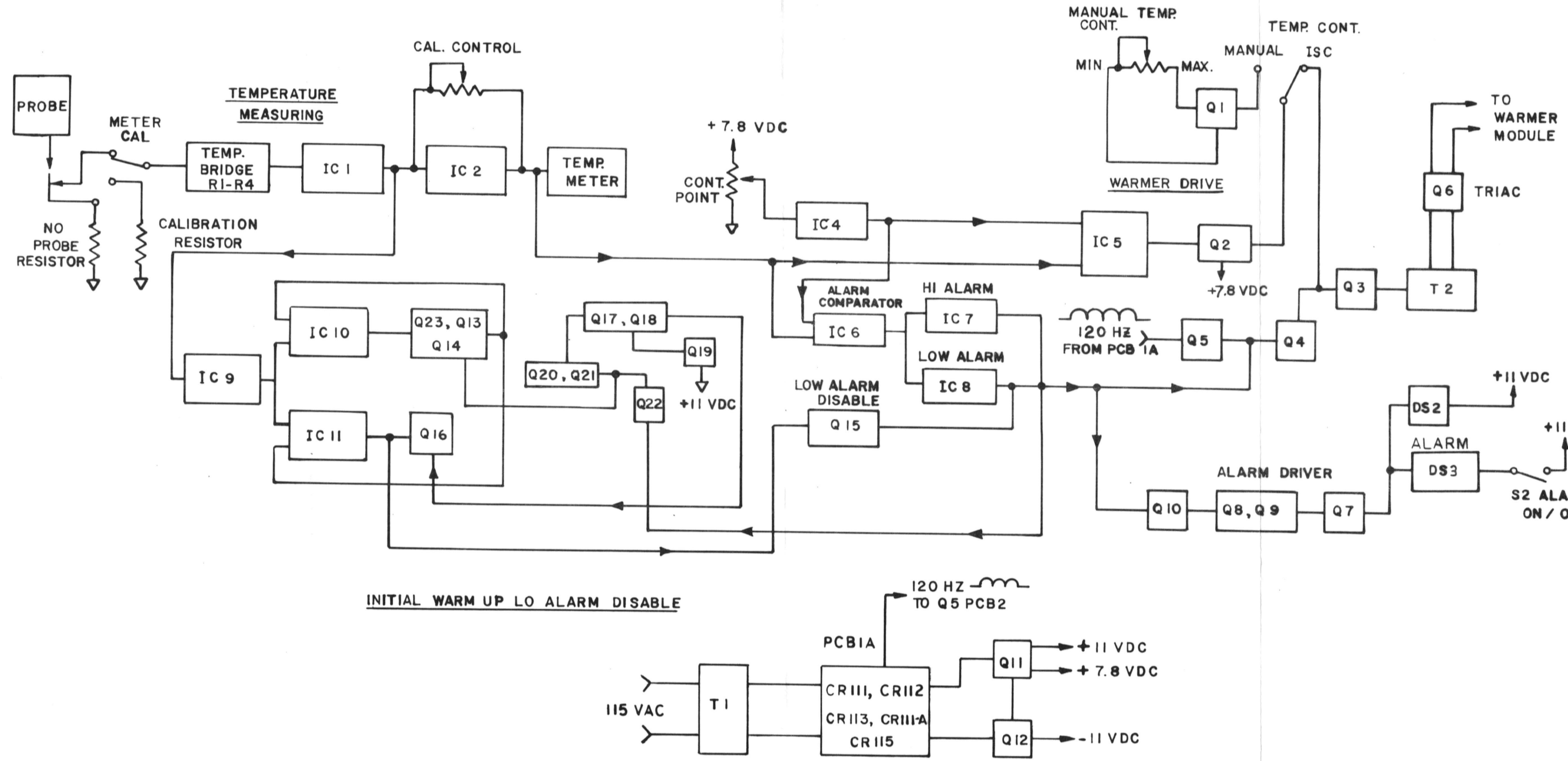

FIGURE 7-2 FUNCTIONAL BLOCK DIAGRAM SERVO CONTROLLER SC 78-1

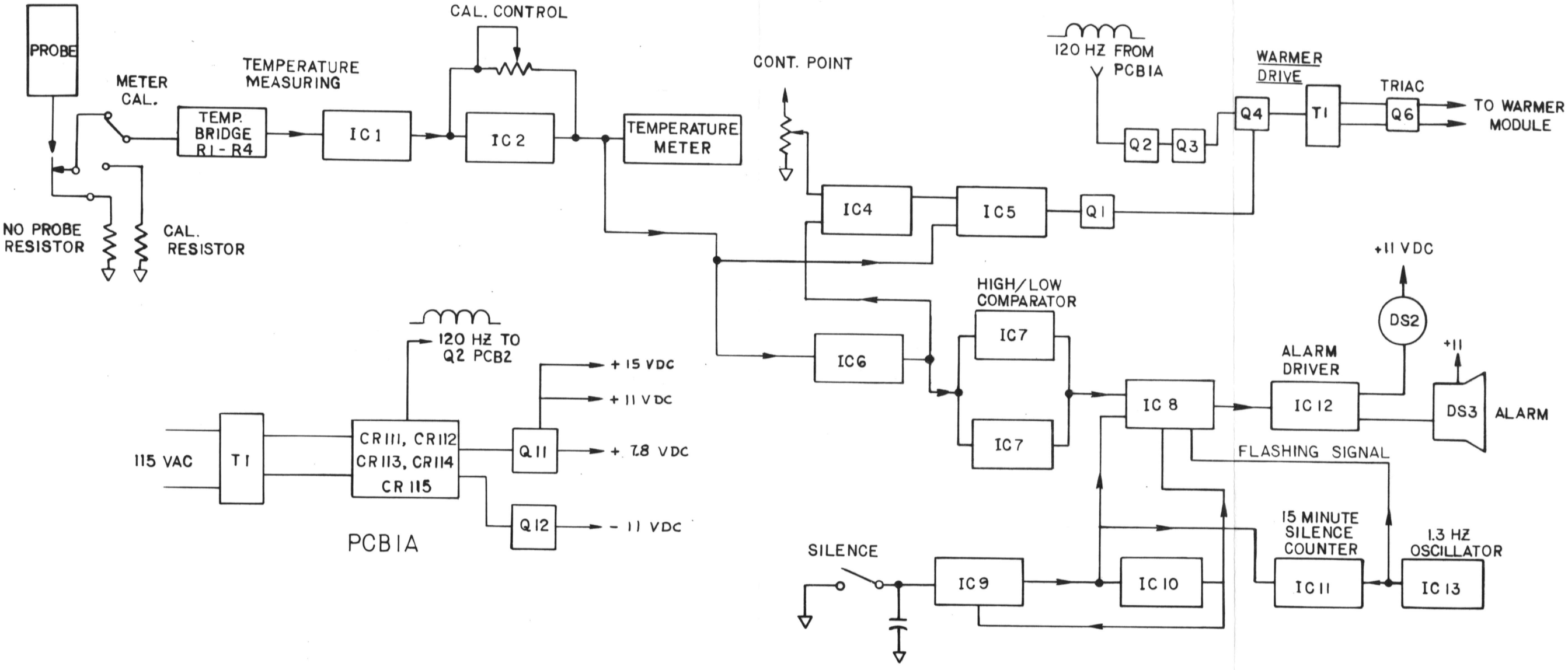

FIGURE 7 3 FUNCTIONAL BLOCK DIAGRAM
SERVO CONTROLLER SC 78-2

PARTS LIST

ITEM NO.	DWG SIZE	IDENT. NO.	DESCRIPTION	QTY	U/M

REVISIONS

5. ECN 2841 REV & REDRAWN. BY MMB 6 SEP 76 SHT. 1
6. ECN 3638 C3 WAS .01μf, 400V MA 26 APR 76 SHT. 1 18 NOV 76
7. ECN 4260 J3-2 WENT TO J3-3. JKA 14 NOV 77 SHT. 1 15 NOV 77
8. ECN 5305 CHG C1 FROM 400V TO 250V. RJH 1 FEB 80 CW 7 FEB 80 SHT. 1 PER SU

OUTPUT (TO HTR)
P1
WHT P3-1 J3-1
GRN
P3-6 J3-6
BLK

INPUT (AC PWR)
P2
GRN
BLK
WHT
F1 P3-4 J3-4
8 AMP
P3-3 J3-3

S1
OFF
ON
W1

SEE NOTE 1

PCB #1
7836070, 100-120V, 50-60 HZ
(7836075, 220-240V, 50 HZ)
SEE NOTE 1

R4
100K
1/2W

R1
MIN
150K
MAX
TEMPERATURE

R2
10K
1/2W

R3
4.7K, 1/2W

Q1
MPT-20

Q2
2N6164
HEAT SINK

C3
0.1μf
630V

C2
0.02μf
400V

C1
0.15μf
250V

L1

DS1
POWER
P3-5 J3-5
P3-2 J3-2

NOTES:
1. COMPONENTS SHOWN ARE FOR 100-120 V, 50-60 HZ OPERATION (PCB 78 360 70). FOR 220-240 V, 50 HZ OPERATION (PCB 78 360 75) CHANGE:
FUSE, F1, TO 5 AMP;
TRIAC, Q2, TO 2N6165;
POT., R1, TO 300 K;
JUMPER, W1, TO R4, 100 K.

NEXT ASSY

UNLESS OTHERWISE SPECIFIED- DIMENSIONS ARE IN INCHES
TOLERANCES ON:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±
ALL SURFACE FINISH √ MAX
DO NOT SCALE DRAWING
MATERIAL

SIGNATURES	DATE
DRAWN Rd. Seifert	7 AUG 74
CHKD J. Lamont	6 SEP 74
ENG	10 SEPT 74
APVD	
FINISH	

ISOLETTE A MARCO MEDICAL COMPANY WARMINSTER, PENNA. 18974 U.S.A.

SCHEMATIC, MANUAL CONTROLLER

SIZE B FIGURE 7.4

SCALE 2/1 SHEET 1 OF 1

1/3

7-7

FIGURE 7.5

SCHEMATIC - SERVO CONTROLLER

NOTES:

1. COMPONENTS SHOWN ARE FOR 110-120V, 60 Hz OPERATION (PCB 1A,7B 310 7I AND PCB 2A,7B 311 7I).
   a. FOR 220-240 V: TRIAC PCB1A-Q6 CHANGES TO 2N6165
      ON PCB 1A, 7B 310 7G, AND FI CHANGES TO 5 AMP.
   b. FOR 50 Hz: RESISTOR PCB 2A-R30 CHANGES TO 8.6K
   c. FOR 100V, 60 OR 400 Hz, PCB 1A CHANGES TO 7B310 77.

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PCB 2A
7831172
(OR 7831177
SEE NOTES 1.a & 1.b)

METER CAL

S3A

ON

J4

R87 1100Ω 1% 1/8W

PAT. PROBE

J10-1

J10-3

J8-11

R1 R3 1300Ω 1.5W 5%

R2 1193Ω 0.1% 1/8W

R5 680Ω 3.75W 5%

+7.8V

R4 10K 5% 1W

R7 10K 1% 1/4W

R10 100K 1% 1/4W

R11 100K 1% 1/4W

R8 1K 1% 1/4W

R6 3.01K 1% 1/4W

R9 1K

R13 499K 1% 1/4W

C1 0.47 µf

R12 499K 1% 1/4W

IC1 1456

R62 1K 1% 1/4W

IC2 1456

C2 0.47 µf

R15 1K 1% 1/4W

CR1 IN914A

TP1

R16 30.1K 1% 1/4 W

J8-7

J8-4

R14 10K

J8-10

R19 3.83K 1% 1/4W

R63 5K

92°F → 104°F

M1

J8-1

R17 3.83K 1% 1/4W

IC3 741

N/C (DS3+)

J8-2

TP4

+11V

R18 1K 1% 1/4W

CR4 IN4735A 6.2V

CR3 IN914A

CR2 IN914A

R58 150Ω

J8-5

J8-8,9

TP6

R30 10K

R20 10K

+7.8V

J9-1

J8-6

POINT CONT

SEE NOTE 1.b

J9-4

R21 2K

R24 20K

R27 100K

R29 3K

Q1 2N4126

IC4 741

IC5 741

R25 20K

R59 47K

R22 10K

R23 2K

R26 47K

R28 100K

TP7

R31 10K

R33 10K

+11V

R35 10Ω

R34 10K

Q2 2N4124

Q3 2N4124

C3 .22µf

R32 10K

R36 820Ω

Q4 2N4893

B2

B1

T1

J9-7

J9-8

+15V

J9-6

TP5

-11V

J8-3

J9-9

+11V

J5-2

J8-12

DS2

ALARM

DS3

R37 470K

C4 .47µf

TP2

R40 470K

R38 470K

IC6 741

R61 470Ω

C5 .47µf

R39 470K

C10 10µf

C12 10µf

R43 1K

R44 15K

R42 1K

R41 15K

-11V

R57 62K

R55 1K

3302

IC7

R56 100K

R52 10K

R60 10K

IC8

4011

IC12 3632

TP3

J9-5

TO P7-4

R53 100K

R54 1.0MEG 1% 1/4W

IC13 555

C8 0.47 µf

IC10

IC11 4040

C11 0.01µf

4001

SPARES

IC9

S3B

S2

SILENCE

J9-2

R45 100K

R46 100K

R47 100K

C6 2.2µf

R48 10K

R50 10K

R49 220K

C9 .01µf

C7 10µf

PCB 1A
7831080
(OR 7831081,82
SEE NOTE 1.a)

J7-6 +15V

J5-9 +11V

J5-2

J7-4

J5-5

J5-7

TO P9-5

CR2 IN4744A

FW RECT

CR111 IN2483

CR115 IN2483

CR112 IN2483

CR113 IN2483

CR114 IN2483

T1

R18 200Ω

R83 200Ω

ZN4921

Q11

R58 330Ω 1/2W,5%

C5 680µf 25V

C6 680µf 25V

CR16 12V IN4742A

CR17 12V IN4742A

C7 25µf 25V

C8 25µf 25V Q12

R59 330Ω 1/2W 5%

2N4918

C4 0.1µf 630V

CR10 IN2483

L1

Q6 2N6164

R61 200Ω

J5-6

J5-8

J6-5

J6-6

J5-1

J5-4

J6-4

J6-1

J6-3

J6-2

DS1

POWER

M2

SEE NOTE 1.B AND 1.C.

F1 (SEE NOTE 1.B)

8 AMP

P2

INPUT AC POWER

BLK

GRN

WHT

OFF

ON

S1

P3

BLK

WHT

GRN

OUTPUT TO HTR

POWER

NOTES:

1. COMPONENTS SHOWN ARE FOR 110-120V, 60HZ OPERATION (PCB 1A 7831080 AND PCB 2A 7831172).
   a. FOR 220-240V: TRIAC PCB 1A-Q6 CHANGES TO 2N6168 ON PCB 1A, 7831081, F1 CHANGES TO 5 AMP, METER M2 CHANGES TO 1777660.
   b. FOR 50 HZ: RESISTOR PCB 2A-RZ9 CHANGES TO 3.6K ON PCB 2A, 7831177.
   c. FOR 100V, 50 OR 60 HZ PCB 1A CHANGES TO 7831082, METER M2 CHANGES TO 1777710.
2. ALL RESISTORS 1/4 W. 5%, UNLESS OTHERWISE SPECIFIED.

IC POWER PIN ASSIGNMENTS			
REF. DESIGNATIONS	+11V	-11V	GND
IC1,2,3,4,& 6	7	4	—
IC5 PIN 7 TO +15V.	—	4	—
IC7	3,9,11	12	—
IC8 & 9	14	—	7
IC10	14	—	7
IC11	16	—	8
IC12	8	—	4
IC13	4,8	—	

PARTS LIST

ITEM NO.	DWG SIZE	IDENT NO	DESCRIPTION	QTY	U/M

REVISIONS

1- ISSUE ECN 4880

2. ECN 4868

3. ECN 5196

4. ECN 5400

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NEXT ASSY: 7830080-85

UNLESS OTHERWISE SPECIFIED— DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ± ALL SURFACE FINISH √ MAX

DO NOT SCALE DRAWING

MATERIAL —"—

SIGNATURES	DATE
DRAWN	8 MAY 78
CHKD C. Wood	21 JUN 78
ENG	22 MAY 78
APVD	
FINISH —"—	

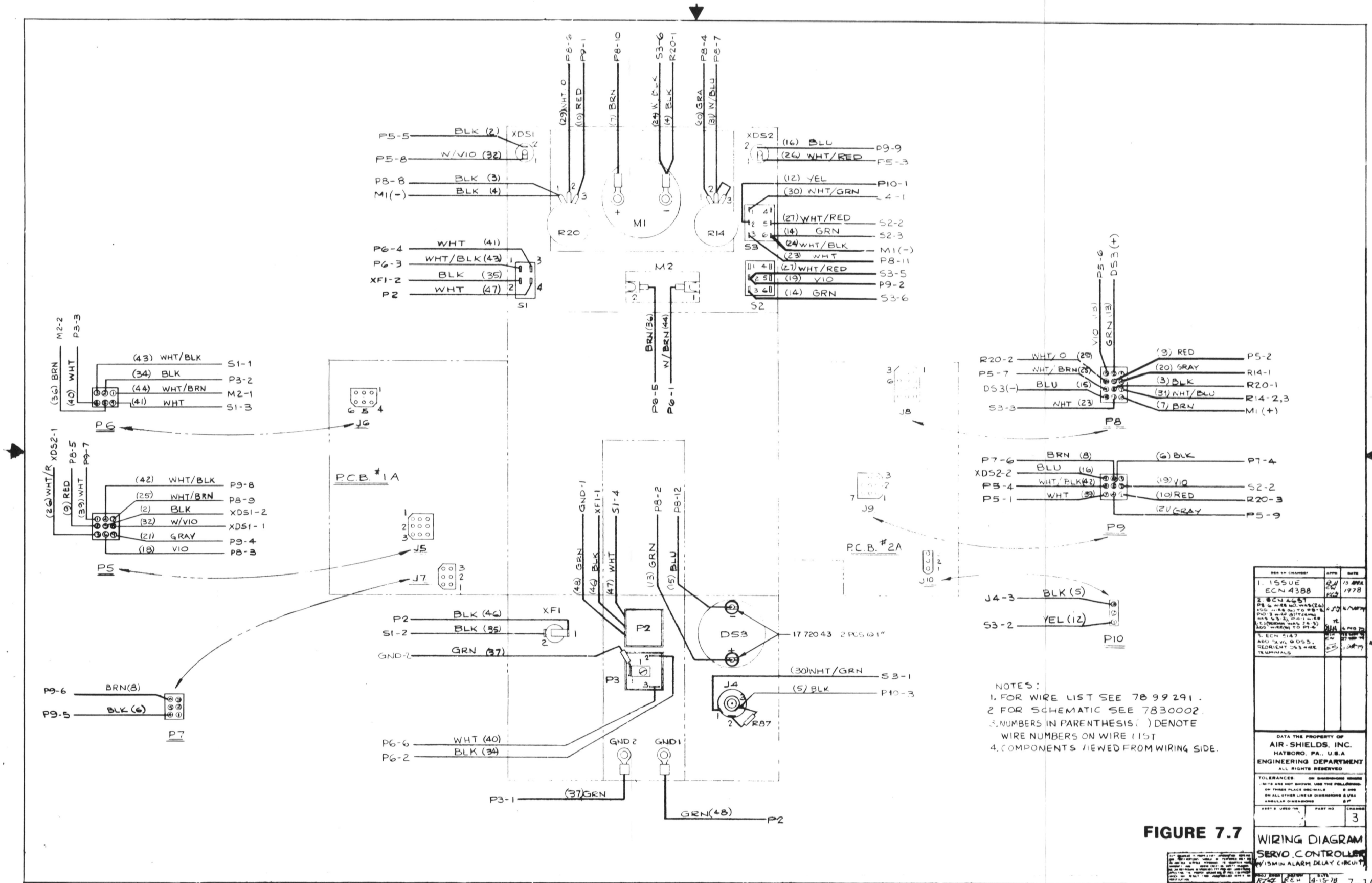
AIR-SHIELDS, INC. A NARCO HEALTH COMPANY HATBORO, PA 19040 U.S.A.

SCHEMATIC, SERVO CONTROLLER (W/ 15 MIN. ALARM DELAY CIRCUIT)

SIZE D

FIGURE 7.6

SCALE —"— SHEET 1 OF 1



NOTES:
1. FOR WIRE LIST SEE 78 99 291.
2. FOR SCHEMATIC SEE 7830002.
3. NUMBERS IN PARENTHESIS ( ) DENOTE WIRE NUMBERS ON WIRE LIST
4. COMPONENTS VIEWED FROM WIRING SIDE.

DESCRIPTION OF CHANGE	APPD	DATE
1. ISSUE ECN 4388		15 APR 1978
2. ECN 4681 P8-6 WIRE NO. WAS (26) NOW P8-6 TO P8-6 P10-3 WAS (5) NOW (16) P10-4 WAS (5,3) NOW (5) ADD WIRE(S) TO P7-6		
3. ECN 5147 ADD 3 WG @ DS3, REORIENT DS3 WIRE TERMINALS		

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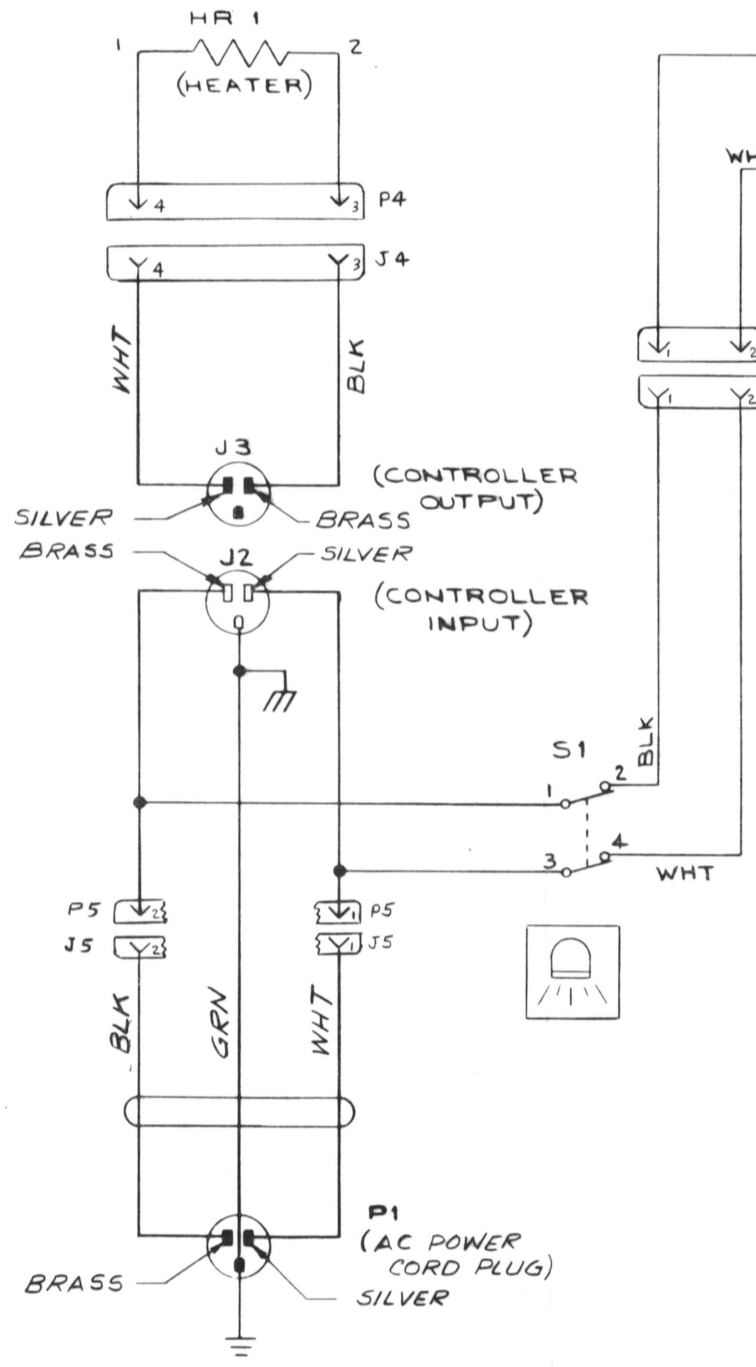
TOLERANCES ON DIMENSIONS WHERE LIMITS ARE NOT SHOWN, USE THE FOLLOWING: ON THREE PLACE DECIMALS ± .005; ON ALL OTHER LINEAR DIMENSIONS & ½ ANGULAR DIMENSIONS ±1°

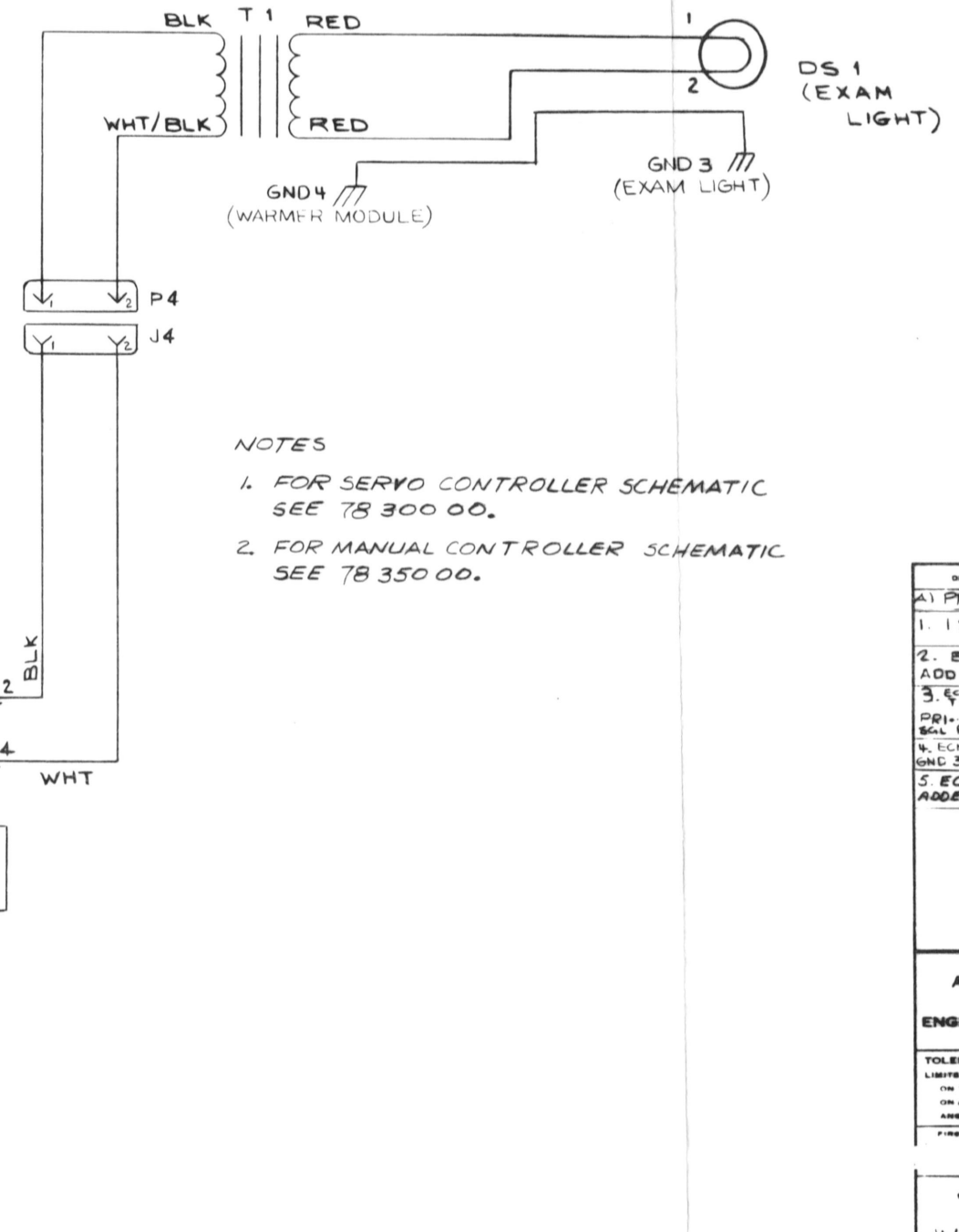
ASSY # USED ON | PART NO | CHANGE 3

FIGURE 7.7

WIRING DIAGRAM SERVO CONTROLLER W/5 MIN ALARM DELAY CIRCUIT

DRWG RKG | CHKD REH | 4-15-78





NOTES

1. FOR SERVO CONTROLLER SCHEMATIC SEE 78 300 00.
2. FOR MANUAL CONTROLLER SCHEMATIC SEE 78 350 00.

DESIGN CHANGES	APPD	DATE
A) PRE-PROD		
1. 1 SSUE		
2. ECN 2500 ADD 100V OPER.		
3. ECN 2876 & 2881 T1 WAS DUAL PRI= (12W 220). S1 WAS SGL POLE 9PB.		
4. ECN 4280 ADDED GND 3 & 4		
5. ECN 5355 ADDED P4, J4, P5, J5		29 MAR 80

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TOLERANCES: ON DIMENSIONS WHERE LIMITS ARE NOT SHOWN, USE THE FOLLOWING:
ON THREE PLACE DECIMALS ± .005
ON ALL OTHER LINEAR DIMENSIONS ± 1/64
ANGULAR DIMENSIONS ± 1°

FIRST USED ON	PART NO	CHANGE
	-	5

SCHEMATIC, WARMER MODULE

FIGURE 7.8

PROJ ENGR	DRAWN	DATE	SCALE
LJ	BHB	12-21-77	—

DRAWING 12267

MATERIAL:

FINISH: